

# Wireless Device Products

## 2013-2014

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# Sumitomo Electric Industries – Reliable, Advanced Technology

## Generating Value for the Customer

As an industry pioneer for over 30 years, Sumitomo Electric Industries has overcome many technical challenges to become the most respected supplier of compound semiconductor products. Our advanced technologies and solutions continue to meet the demand of growing and diverse markets in the area of information/communications and sensor/radar. At Sumitomo Electric Industries, we are committed to providing the best value for our customers while protecting the global environment.

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# Wireless Devices Total RF Solutions from SUMITOMO ELECTRIC

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### Applications

LTE

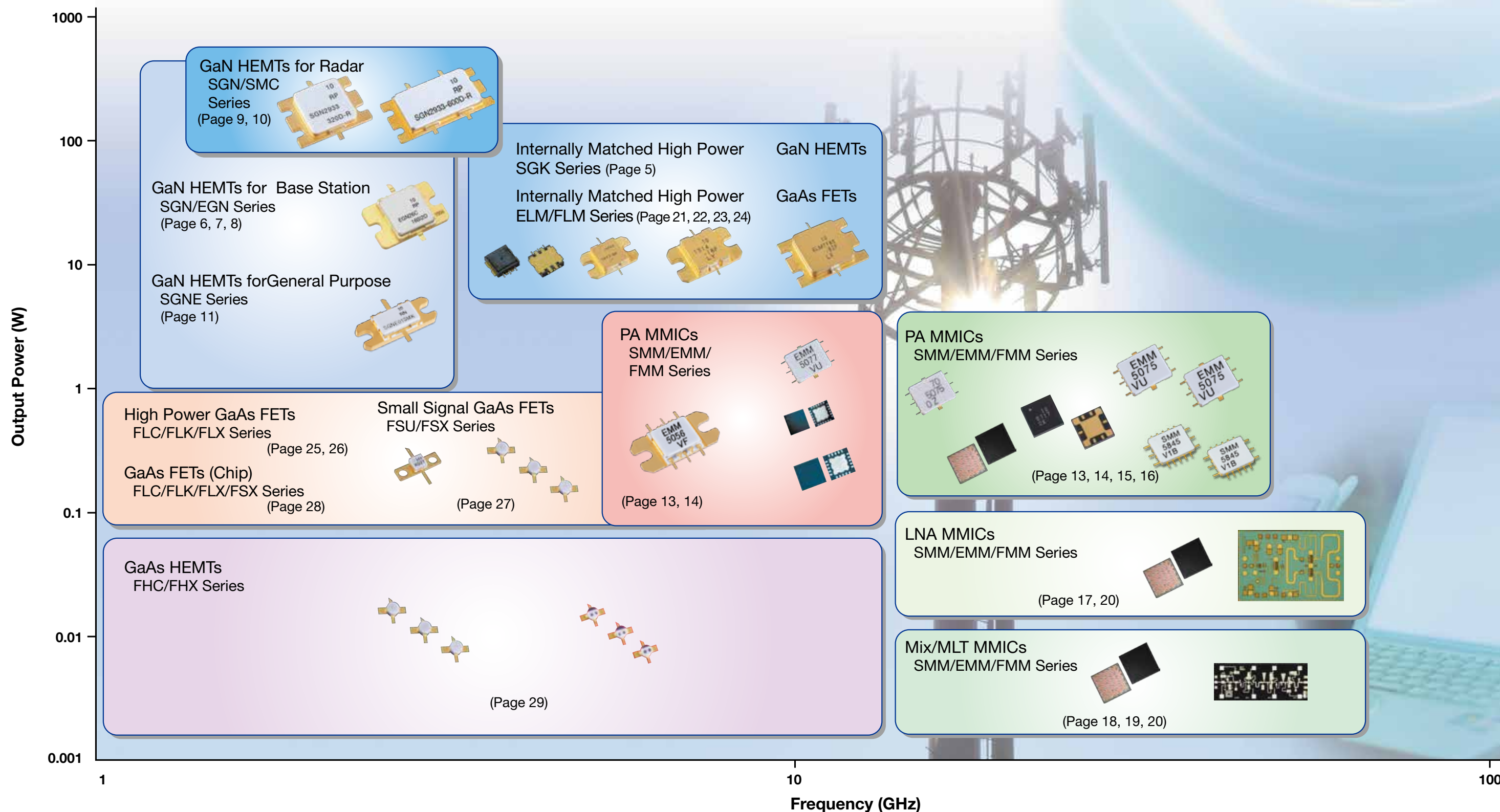
P-to-P  
SATCOM

VSAT

P-to-P

VSAT

FWA  
P-to-P



# Internally Matched High Power GaN HEMTs

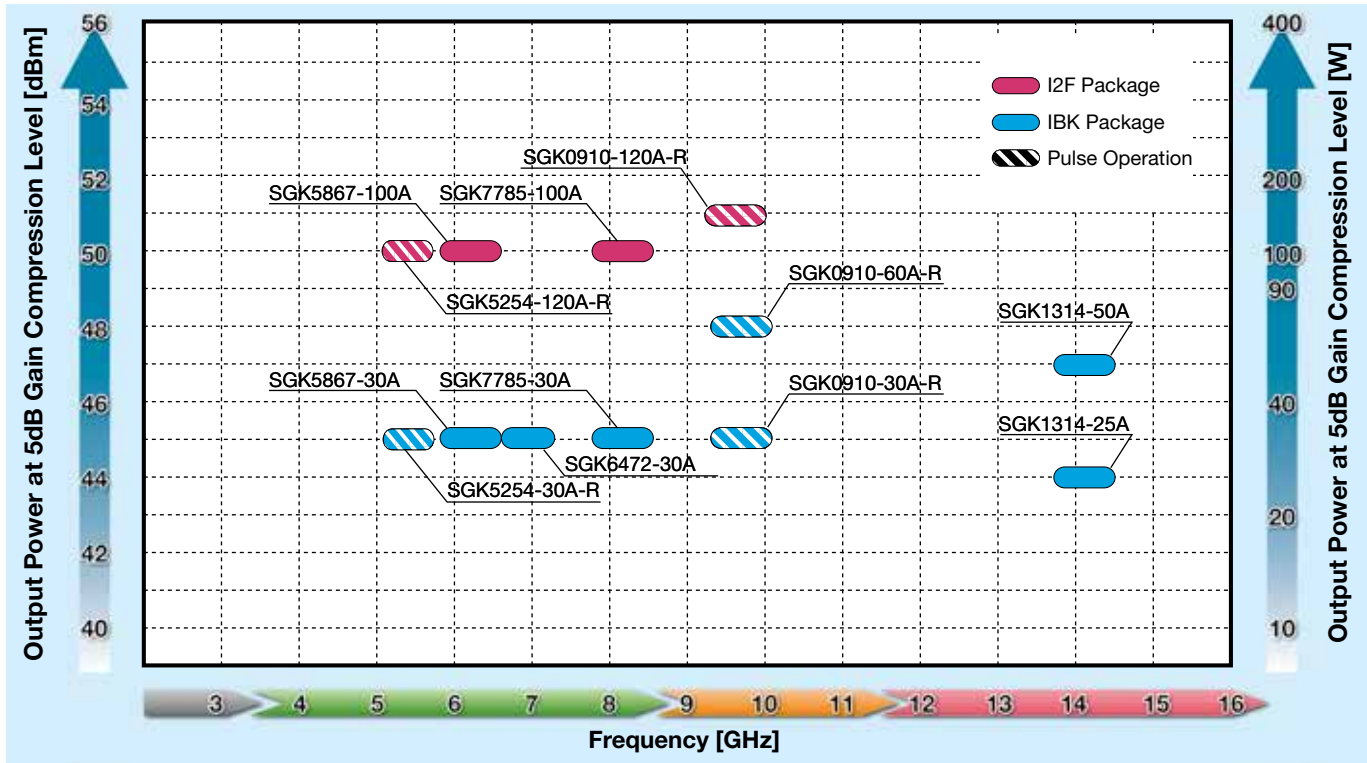
# GaN HEMTs (High Electron Mobility Transistors)

## For Radar & Satcom

### Features

- High Output Power
- High Gain
- High PAE
- High Efficiency
- Internally Matched

### ◆Internally Matched High Power GaN HEMT Lineup

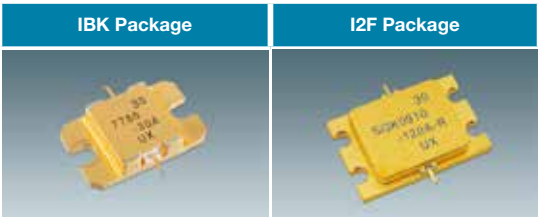


### Specifications

| Part Number    | Frequency Band | 2tone test     |                    | P5dB Typ. (dBm) | GL Typ. (dB) | $\eta_{add}$ Typ. (%) | Frequency f (GHz) | VDS Typ. (V) | IDS(DC) Typ. (A) | Rth Typ. (deg. C/W) | Outline/Package Code | Operation Mode               |
|----------------|----------------|----------------|--------------------|-----------------|--------------|-----------------------|-------------------|--------------|------------------|---------------------|----------------------|------------------------------|
|                |                | IM3 Typ. (dBc) | @Pout S.C.L. (dBm) |                 |              |                       |                   |              |                  |                     |                      |                              |
| SGK5254-30A-R  | C              | -              | -                  | 45.5            | 16.5         | 49                    | 5.2-5.4           | 24           | 1.3              | 2.2                 | IBK                  | Pulse Operation              |
| SGK5254-120A-R | C              | -              | -                  | 51.5            | 16.5         | 47                    | 5.2-5.4           | 24           | 5.3              | 0.65                | I2F                  | Pulse Width:100usec Duty:10% |
| SGK5867-30A    | C              | -45            | 29.5               | 45              | 13.5         | 45                    | 5.85-6.75         | 24           | 1.75             | 2.2                 | IBK                  | CW Operation                 |
| SGK5867-100A   | C              | -25            | 44.0               | 50              | 13.5         | 45                    | 5.85-6.75         | 24           | 4.0              | 0.55                | I2F                  |                              |
| SGK6472-30A    | C              | -45            | 29.5               | 40              | 12.5         | 40                    | 6.4-7.2           | 24           | 1.75             | 2.2                 | IBK                  |                              |
| SGK7785-30A    | C              | -45            | 29.5               | 45              | 12.0         | 39                    | 7.7-8.5           | 24           | 1.75             | 2.2                 | IBK                  |                              |
| SGK7785-100A   | C              | -25            | 44.0               | 50              | 12.0         | 42                    | 7.7-8.5           | 24           | 4.0              | 0.55                | I2F                  | Pulse Operation              |
| SGK0910-30A-R  | X              | -              | -                  | 45              | 12.0         | 35                    | 9.2-10            | 24           | 1.3              | 2.2                 | IBK                  |                              |
| SGK0910-60A-R  | X              | -              | -                  | 48              | 12.0         | 35                    | 9.2-10            | 24           | 2.6              | 1.1                 | IBK                  |                              |
| SGK0910-120A-R | X              | -              | -                  | 51              | 11.5         | 35                    | 9.2-10            | 24           | 5.3              | 0.65                | I2F                  |                              |
| SGK1314-25A    | Ku             | -25            | 37                 | 44              | 8.0          | 29                    | 13.75-14.5        | 24           | 2.5              | 1.8                 | IBK                  | CW Operation                 |
| SGK1314-50A    | Ku             | -25            | 40                 | 47              | 8.0          | 29                    | 13.75-14.5        | 24           | 5                | 1.3                 | IBK                  |                              |

Note: Tc (op)=+25°C  
IM3: 3rd Order Intermodulation Distortion

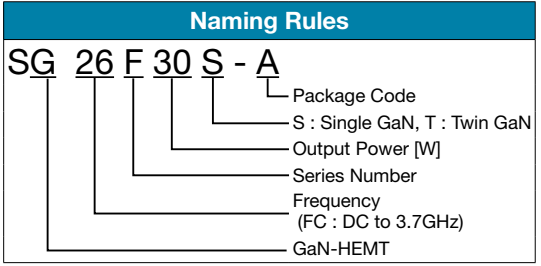
### Product Photo



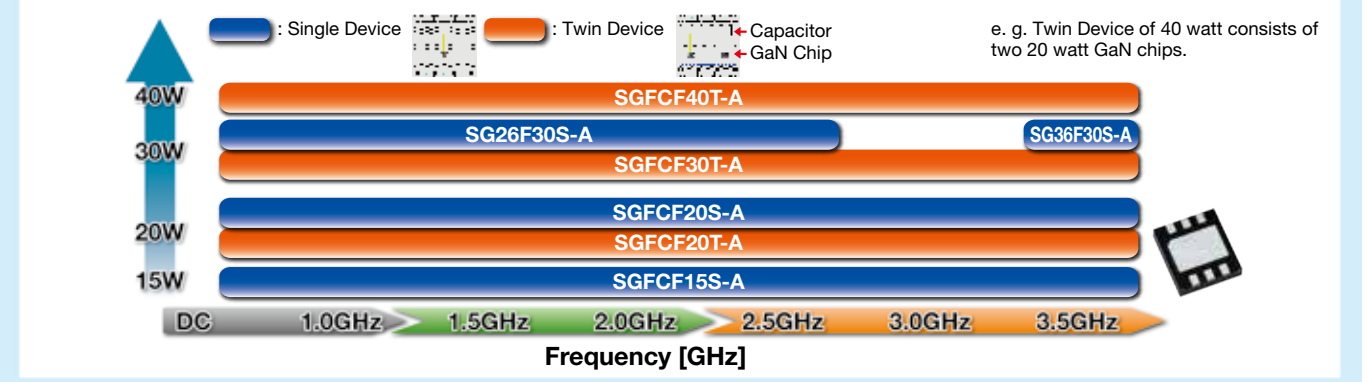
## For Base Staion (F Series)

### Features

- Designed for 3G/LTE/WiMAX Base Station
- Driver Stage for Macrocell & Final Stage for Microcell
- High Operationg Voltage : 50V
- High Gain : Gp=19dB @f=2.65GHz, 20W (SGFCF20S-A)
- High Efficiency : 65% @f=2.65GHz, 20W (SGFCF20S-A)
- Full Molde SMT Package (Z2A)



## “F Series” Lineup

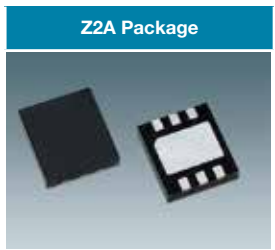


### Specifications (Driver and Final Stage)

| Part Number             | Single / Twin | Operation Freq. (GHz) | Measurement Freq. (GHz) | Psat <sup>1</sup> Typ. (dBm) | Pout <sup>2</sup> (Ave.) (dBm) | GP <sup>2</sup> @Pout(Ave.) Typ.(dB) | $\eta$ <sup>2</sup> @Pout(Ave.) Typ.(%) | VDS (V) | IDS(DC) (mA) | Rth <sup>3</sup> Typ. (°C/W) | PKG Code |
|-------------------------|---------------|-----------------------|-------------------------|------------------------------|--------------------------------|--------------------------------------|-----------------------------------------|---------|--------------|------------------------------|----------|
| SGFCF15S-A              | Single        | DC-3.7GHz             | 2.65GHz                 | 42.5                         | 29.0                           | 19.0                                 | 13.5                                    | 50      | 75           | 9.0                          | Z2A      |
| SGFCF20S-A              | Single        | DC-3.7GHz             | 2.65GHz                 | 44.0                         | 30.5                           | 19.0                                 | 13.5                                    | 50      | 100          | 7.0                          |          |
| SG26F30S-A              | Single        | DC-2.7GHz             | 2.65GHz                 | 46.0                         | 32.5                           | 18.5                                 | 13.5                                    | 50      | 150          | 5.5                          |          |
| SG36F30S-A              | Single        | 3.3-3.7GHz            | 3.60GHz                 | 45.5                         | 32.0                           | 16.0                                 | 13.0                                    | 50      | 150          | 5.5                          |          |
| SGFCF20T-A <sup>4</sup> | Twin          | DC-3.7GHz             | 2.65GHz                 | 41.0                         | 27.5                           | 19.5                                 | 13.5                                    | 50      | 50           | 10.0                         |          |
| SGFCF30T-A <sup>4</sup> | Twin          | DC-3.7GHz             | 2.65GHz                 | 42.5                         | 29.0                           | 19.0                                 | 13.5                                    | 50      | 75           | 9.0                          |          |
| SGFCF40T-A <sup>4</sup> | Twin          | DC-3.7GHz             | 2.65GHz                 | 44.0                         | 30.5                           | 19.0                                 | 13.5                                    | 50      | 100          | 7.0                          |          |

RF Parameter sample size 10pcs. Criteria(accept/reject)=(0/1)  
\*1:10%-duty RF pulse(DC supply constant)  
\*2:Pout=(Ave.) , W-CDMA(3GPP3.4 12-00)BS-1 64ch 85% clipping modulation(PAR=8.5dB@0.01%)  
\*3:Thermal resistance of channel to case(Not include the thermal resistance of substrate)  
\*4:Specification of one path  
Note: Tc (op)=+25°C

### Product Photo



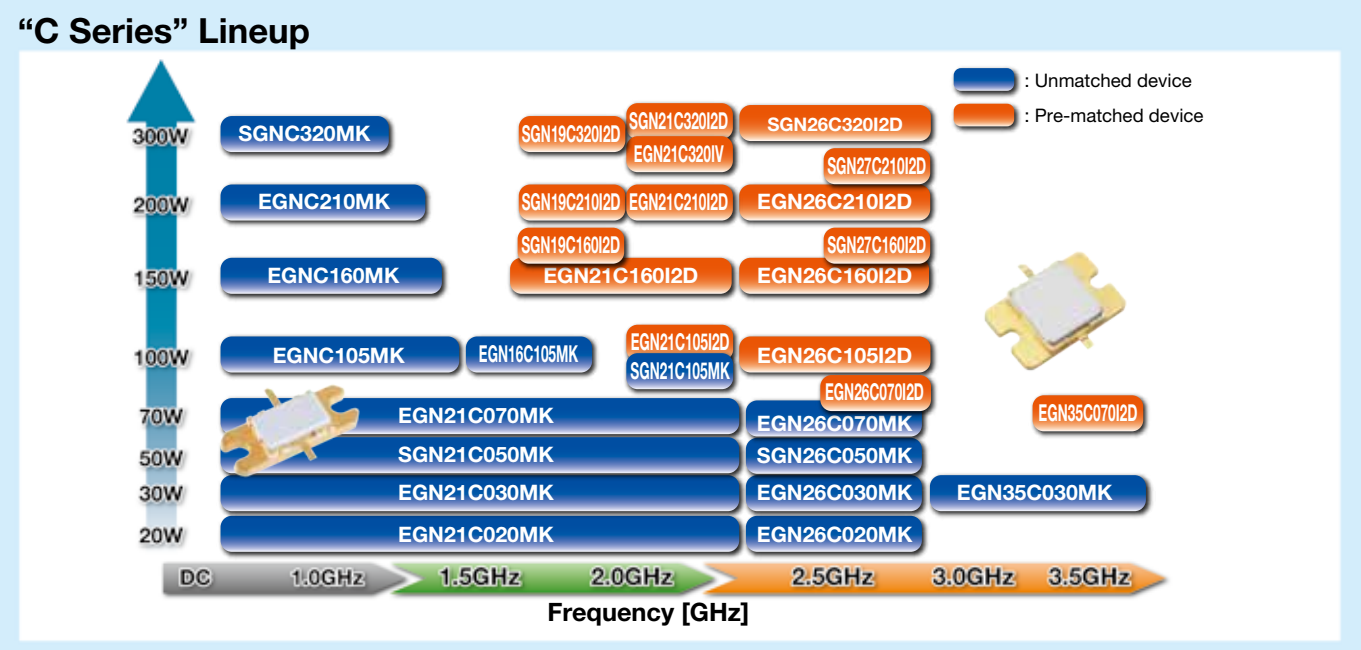
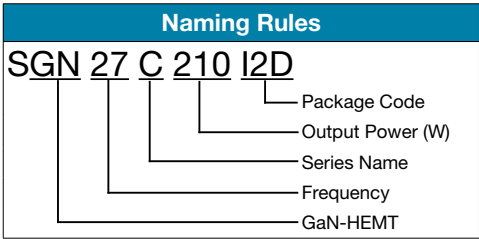
# GaN HEMTs (High Electron Mobility Transistors)

# GaN HEMTs (High Electron Mobility Transistors)

## For Base Station (C Series)

### Features

- Designed for 3G/LTE/WiMAX Base Station
- Optimized for Doherty Architecture
- Higher Load Impedance: 15 to 20Ω @Final Stage (Easy Match, Wide Band)
- High Operating Voltage: 50V
- High Power: Up to 320W Psat Single Ended
- High Gain: Gp=16dB @f=2.6GHz, 210W Device
- High Efficiency: 60-70% with Internal Class F Matching



### Specifications (Driver Stage)

| Part Number | Frequency (GHz) | Psat <sup>*1</sup> Typ. (dBm) | Pout <sup>*2</sup> (Ave.) Typ. (dBm) | GP <sup>*2</sup> Typ. (dB) | η <sup>*2</sup> @Pout (Ave.) Typ. (%) | VDS (V) | IDS (DC) (mA) | Rth Typ. (°C/W) | Outline/Package Code |
|-------------|-----------------|-------------------------------|--------------------------------------|----------------------------|---------------------------------------|---------|---------------|-----------------|----------------------|
| EGN21C020MK | 2.14            | 43.5                          | 30.0                                 | 19.0                       | 12.5                                  | 50      | 100           | 6.0             | MK                   |
| EGN21C030MK | 2.14            | 45.0                          | 31.5                                 | 19.0                       | 12.5                                  | 50      | 150           | 5.0             |                      |
| EGN26C020MK | 2.6             | 43.5                          | 30.0                                 | 18.0                       | 12.5                                  | 50      | 100           | 6.0             |                      |
| EGN26C030MK | 2.6             | 45.0                          | 31.5                                 | 18.0                       | 12.5                                  | 50      | 150           | 5.0             |                      |
| EGN35C030MK | 3.5             | 45.0                          | 31.5                                 | 16.5                       | 11.0                                  | 50      | 150           | 5.0             |                      |

\*1: 10%-duty RF pulse(DC supply constant)

\*2 : Pout=(Ave.), CW

Note: Tc (op)=+25°C

### Specifications (Final Stage)

| Part Number  | Frequency (GHz) | Psat <sup>*1</sup> Typ. (dBm) | Pout (Ave.) Typ. (dBm) | GP Typ. (dB)      | η@Pout (Ave.) Typ. (%) | VDS (V) | IDS (DC) (mA) | Rth Typ. (°C/W) | Outline/Package Code |
|--------------|-----------------|-------------------------------|------------------------|-------------------|------------------------|---------|---------------|-----------------|----------------------|
| EGNC105MK    | 0.9             | 51.0                          | 43.0 <sup>3</sup>      | 20.0 <sup>3</sup> | 35 <sup>3</sup>        | 50      | 400           | 2.0             | MK                   |
| EGNC160MK    | 0.9             | 52.5                          | 44.5 <sup>3</sup>      | 18.0 <sup>3</sup> | 35 <sup>3</sup>        | 50      | 600           | 1.4             |                      |
| EGNC210MK    | 0.9             | 53.5                          | 45.5 <sup>3</sup>      | 17.5 <sup>3</sup> | 35 <sup>3</sup>        | 50      | 750           | 1.1             |                      |
| EGN16C105MK  | 1.6             | 50.5                          | 42.5 <sup>3</sup>      | 19.0 <sup>3</sup> | 33 <sup>3</sup>        | 50      | 400           | 2.0             | I2D                  |
| SGN19C160I2D | 1.96            | 52.3                          | 44.5 <sup>3</sup>      | 18.0 <sup>3</sup> | 35 <sup>3</sup>        | 50      | 600           | 1.4             |                      |
| SGN19C210I2D | 1.9             | 53.0                          | 45.0 <sup>3</sup>      | 18.5 <sup>3</sup> | 32 <sup>3</sup>        | 50      | 750           | 1.1             | MK                   |
| SGN21C105MK  | 2.1             | 50.3                          | 42.5 <sup>3</sup>      | 17.0 <sup>3</sup> | 32 <sup>3</sup>        | 50      | 400           | 2.0             |                      |
| SGN21C050MK  | 2.14            | 47.0                          | 39.0 <sup>3</sup>      | 18.5 <sup>3</sup> | 33 <sup>3</sup>        | 50      | 200           | 3.0             |                      |
| EGN21C070MK  | 2.14            | 49.5                          | 41.5 <sup>3</sup>      | 17.0 <sup>3</sup> | 33 <sup>3</sup>        | 50      | 300           | 2.5             | I2D                  |
| EGN21C105I2D | 2.14            | 50.3                          | 42.0 <sup>2</sup>      | 18.0 <sup>2</sup> | 32 <sup>2</sup>        | 50      | 400           | 2.0             |                      |
| EGN21C160I2D | 2.14            | 52.5                          | 44.5 <sup>2</sup>      | 18.0 <sup>2</sup> | 32 <sup>2</sup>        | 50      | 600           | 1.4             | IV                   |
| EGN21C210I2D | 2.14            | 53.0                          | 45.0 <sup>2</sup>      | 18.0 <sup>2</sup> | 32 <sup>2</sup>        | 50      | 750           | 1.1             |                      |
| EGN21C320IV  | 2.14            | 55.0                          | 47.0 <sup>2</sup>      | 18.0 <sup>2</sup> | 31 <sup>2</sup>        | 50      | 1100          | 0.8             | MK                   |
| SGN26C050MK  | 2.6             | 47.0                          | 39.0 <sup>3</sup>      | 17.5 <sup>3</sup> | 33 <sup>3</sup>        | 50      | 200           | 3.0             |                      |
| EGN26C070MK  | 2.6             | 48.8                          | 40.8 <sup>3</sup>      | 16.5 <sup>3</sup> | 30 <sup>3</sup>        | 50      | 300           | 2.5             |                      |
| EGN26C070I2D | 2.6             | 48.8                          | 40.8 <sup>3</sup>      | 18.0 <sup>3</sup> | 35 <sup>3</sup>        | 50      | 300           | 2.5             | I2D                  |
| EGN26C105I2D | 2.6             | 50.3                          | 42.0 <sup>3</sup>      | 17.0 <sup>3</sup> | 32 <sup>3</sup>        | 50      | 400           | 2.0             |                      |
| EGN26C160I2D | 2.6             | 52.5                          | 44.5 <sup>3</sup>      | 16.0 <sup>3</sup> | 30 <sup>3</sup>        | 50      | 600           | 1.4             |                      |
| EGN26C210I2D | 2.6             | 53.0                          | 45.0 <sup>3</sup>      | 16.0 <sup>3</sup> | 30 <sup>3</sup>        | 50      | 750           | 1.1             |                      |
| SGN27C160I2D | 2.65            | 52.5                          | 44.5 <sup>3</sup>      | 16.3 <sup>3</sup> | 30 <sup>3</sup>        | 50      | 600           | 1.4             |                      |
| SGN27C210I2D | 2.65            | 53.0                          | 45.0 <sup>3</sup>      | 16.3 <sup>3</sup> | 30 <sup>3</sup>        | 50      | 750           | 1.1             |                      |
| EGN35C070I2D | 3.5             | 48.8                          | 40.8 <sup>3</sup>      | 15.5 <sup>3</sup> | 28 <sup>3</sup>        | 50      | 300           | 2.5             |                      |

\*1: 10%-duty RF pulse(DC supply constant)

\*2: Pout=(Ave.), f0=2.135GHz, f1=2.145GHz, W-CDMA (3GPP3.4 12-00) BS-1 64ch 47.5% clipping modulation (PAR=8.5dB@0.01%)

\*3: Pout=(Ave.), W-CDMA (3GPP3.4 12-00) BS-1 64ch 65% clipping modulation (PAR=8.5dB@0.01%)

Note: Tc (op)=+25°C

### Specifications (Peak Stage of Doherty Amplifier)

| Part Number  | Frequency (GHz) | Psat <sup>*1</sup> Typ. (dBm) | GP <sup>*2</sup> Typ. (dB) | VDS (V) | Rth Typ. (°C/W) | Outline/Package Code |
|--------------|-----------------|-------------------------------|----------------------------|---------|-----------------|----------------------|
| SGNC320MK    | 0.9             | 55.0                          | 16.5                       | 50      | 1.2             | MK                   |
| SGN19C320I2D | 1.9             | 55.0                          | 18.0                       | 50      | 1.2             | I2D                  |
| SGN21C320I2D | 2.14            | 55.0                          | 17.5                       | 50      | 1.2             |                      |
| SGN26C320I2D | 2.6             | 55.0                          | 16.0                       | 50      | 1.2             |                      |

\*1: 10%-duty RF pulse (DC supply constant : IDS(DC)=10mA)

\*2: Pout=3dB back off point, 10%-duty RF pulse (DC supply constant : IDS(DC)=10mA)

Note: Tc (op)=+25°C

### Product Photo



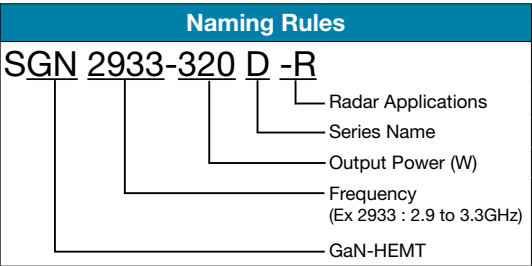
# GaN HEMTs (High Electron Mobility Transistors)

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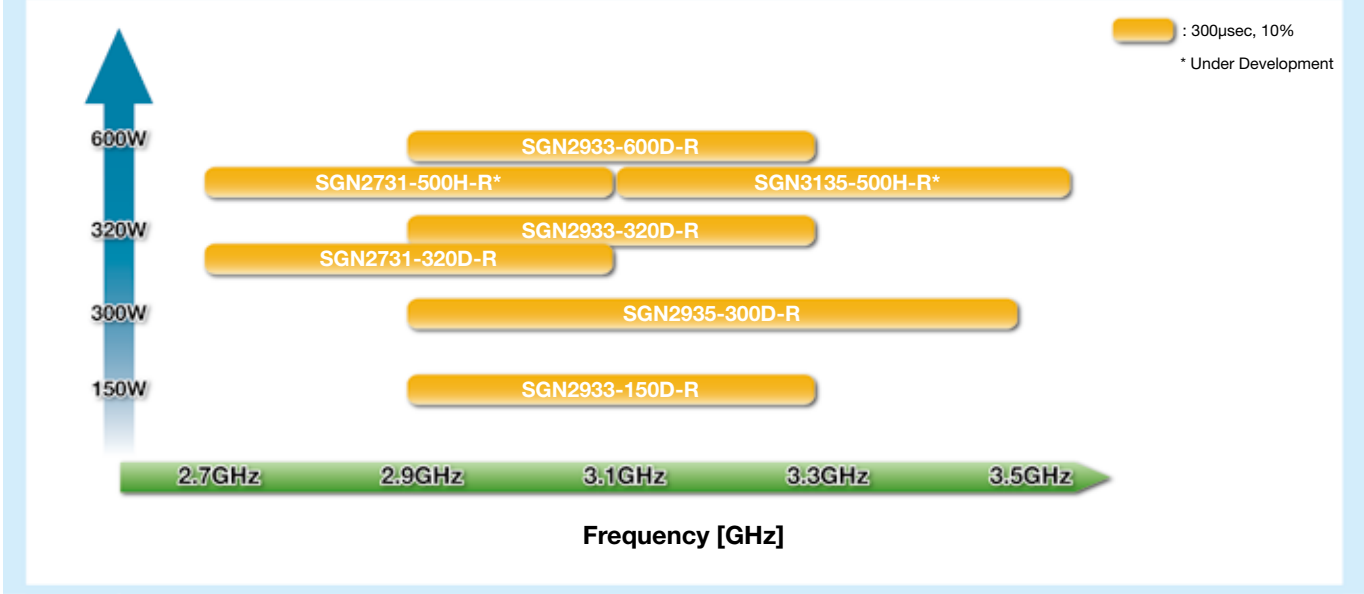
## For Radar

### Features

- Designed for S-band Radar Applications
- 50 ohm matched
- Broadband Operation: 400 - 600MHz
- High Operating Voltage: 50V
- High Power: Up to 600W
- High Efficiency: 50%
- High Gain
- Low Thermal Resist ance (Rth)



## Discrete Transistors



## Specifications

| Part Number     | Frequency (GHz) | Pout min. (W) | Power Gain min. (dB) | Efficiency Typ. (%) | VDS (V) | IDS (DC) (mA) | Outline/ Package Code |
|-----------------|-----------------|---------------|----------------------|---------------------|---------|---------------|-----------------------|
| SGN2731-320D-R  | 2.7-3.1         | 320           | 13                   | 50                  | 50      | 1500          | IV                    |
| SGN2731-500H-R* | 2.7-3.1         | 500           | 12.5                 | 60                  | 50      | 1500          |                       |
| SGN2933-150D-R  | 2.9-3.3         | 150           | 13.8                 | 50                  | 50      | 750           |                       |
| SGN2933-320D-R  | 2.9-3.3         | 320           | 13                   | 50                  | 50      | 1500          |                       |
| SGN2933-600D-R  | 2.9-3.3         | 600           | 12.8                 | 50                  | 50      | 3000          | M1B                   |
| SGN2935-300D-R  | 2.9-3.5         | 300           | 12.8                 | 48                  | 50      | 1500          | IV                    |
| SGN3135-500H-R* | 3.1-3.5         | 500           | 12.5                 | 60                  | 50      | 1500          |                       |

\* Under Development

Pulse Operation : Pulse Width 300µsec, Duty 10%  
Note: Tc (op)=+25°C

## Specifications (Driver Stage)

| Part Number | Frequency (GHz) | P3dB min. (dBm) | GL min. (dB) | η@P3dB Typ. (%) | VDS (V) | IDS (DC) (mA) | Outline/ Package Code |
|-------------|-----------------|-----------------|--------------|-----------------|---------|---------------|-----------------------|
| SGNE010MK   | 3.5             | 40.5            | 16           | 55              | 50      | 100           | MK                    |
| SGN31E030MK | 3.1             | 46              | 15           | 40              | 50      | 200           |                       |

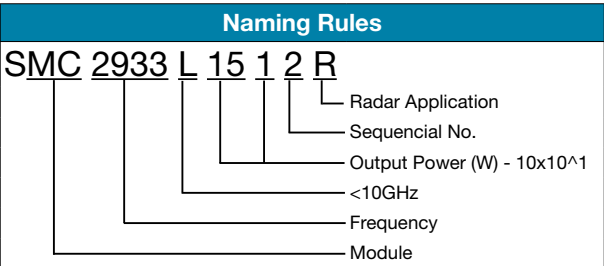
\* Under Development

Note: Tc (op)=+25°C

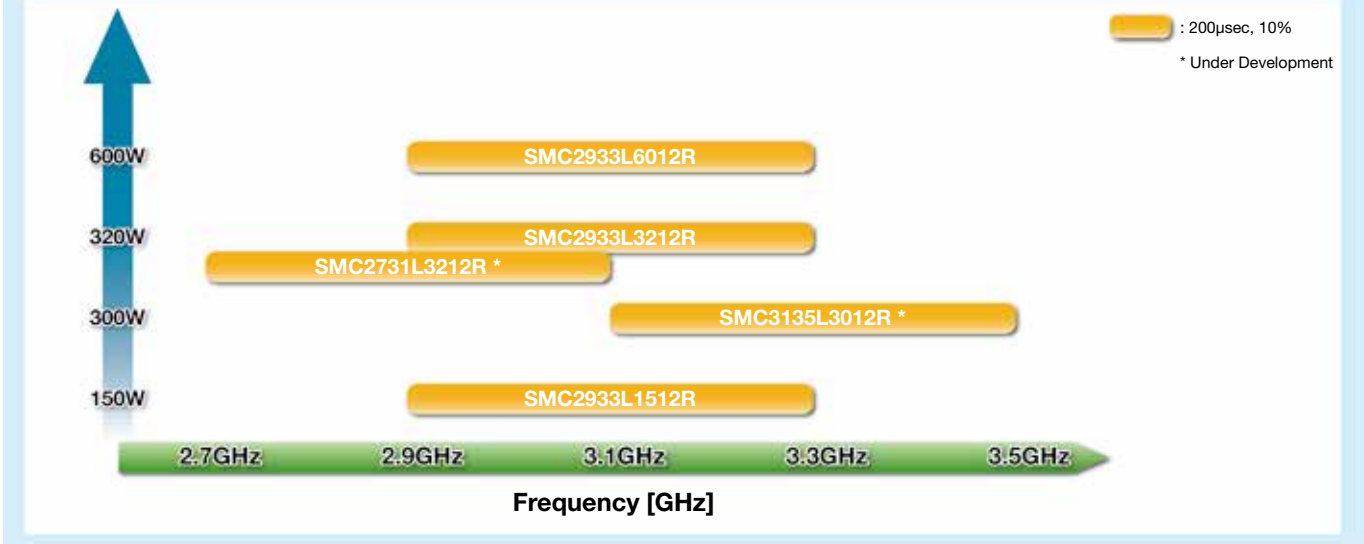
## GaN HEMT Pallet Amplifiers for Radar

### Features

- Designed for S-band Radar Applications
- 50 ohm matched
- Broadband Operation: 400MHz
- High Operating Voltage: 50V
- High Power: Up to 600W
- High Efficiency: 50%
- High Gain
- RC Bias Circuits included
- Copper Base



## Pallets 50Ω Matched Input / Output



## Specifications

| Part Number    | Frequency (GHz) | Pout min. (W) | Power Gain min. (dB) | Efficiency Typ. (%) | VDS (V) | IDS (DC) (mA) | Outline/ Package Code |
|----------------|-----------------|---------------|----------------------|---------------------|---------|---------------|-----------------------|
| SMC2731L3212R* | 2.7-3.1         | 320           | 13                   | 50                  | 50      | 1500          | Pallet-M              |
| SMC2933L1512R  | 2.9-3.3         | 150           | 13.8                 | 50                  | 50      | 750           | Pallet-S              |
| SMC2933L3212R  | 2.9-3.3         | 320           | 13                   | 50                  | 50      | 1500          |                       |
| SMC2933L6012R  | 2.9-3.3         | 600           | 12.8                 | 50                  | 50      | 3000          | Pallet-L              |
| SMC3135L3012R* | 3.1-3.5         | 300           | 13                   | 48                  | 50      | 1500          | Pallet-S              |

\* Under Development

Pulse Operation : Pulse Width 200µsec, Duty 10%  
Note: Tc (op)=+25°C

## Product Photo

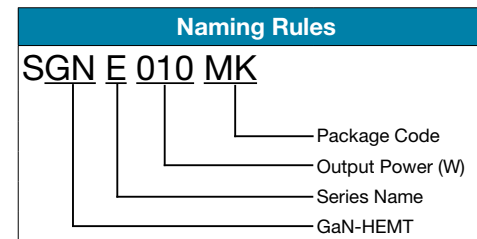


# GaN HEMTs (High Electron Mobility Transistors)

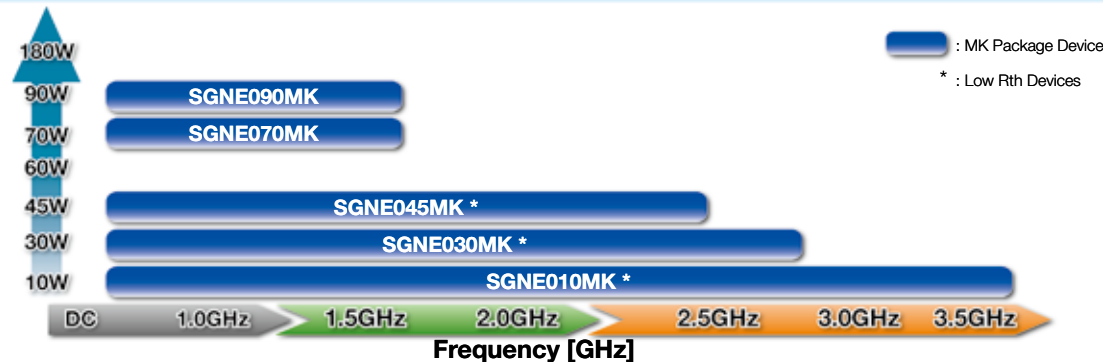
## For General Purpose

### Features

- Higher Gain:  $GL=16\text{dB}$  @ $f=2.7\text{GHz}$ , 30W Device
- High Operating Voltage: 50V
- Low Thermal Resistance ( $R_{th}$ )



## Lineup



## Specifications

| Part Number | Frequency (GHz) | Psat Typ. (dBm) | GL Typ. (dB) | $\eta$ @Psat Typ. (%) | IDS (DC) (mA) | Rth Typ. ( $^{\circ}\text{C/W}$ ) | Outline/Package Code |
|-------------|-----------------|-----------------|--------------|-----------------------|---------------|-----------------------------------|----------------------|
| SGNE010MK   | 3.5             | 40.5            | 16.0         | 55                    | 100           | 4.5                               | MK                   |
| SGNE030MK   | 2.7             | 46.5            | 16.0         | 55                    | 200           | 2.0                               |                      |
| SGNE045MK   | 2.2             | 47.5            | 15.0         | 55                    | 250           | 1.4                               |                      |
| SGNE070MK   | 0.9             | 49.5            | 20.0         | 65                    | 400           | 1.5                               |                      |
| SGNE090MK   | 0.9             | 51.0            | 20.0         | 65                    | 500           | 1.2                               |                      |

Note:  $T_c=+25^{\circ}\text{C}$ 

## Product Photo



# WLCSP MMICs for Micro/Millimeter-wave Applications

SEI/SEDI proposes the WLCSP (Wafer Level Chip Scale Package) technology for the solution of the next generation device.

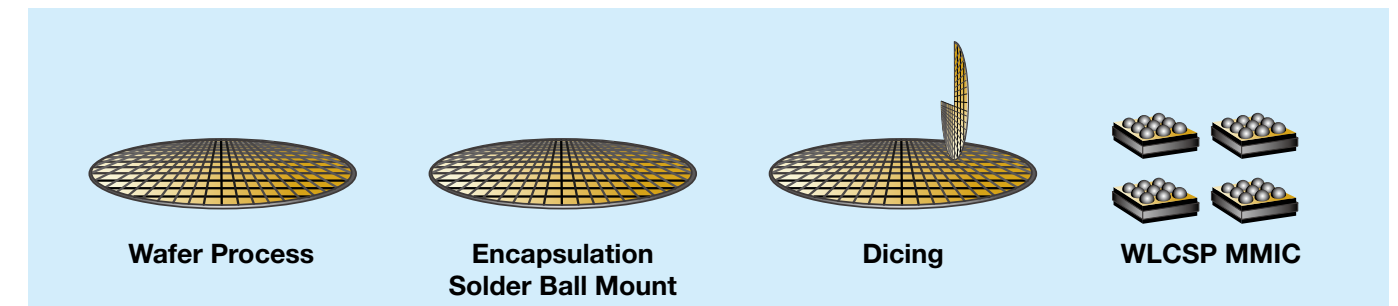
This technology achieved a very excellent frequency performance by uniting with 3-D MMIC technology, and can apply from C to E-band applications.

The WLCSP chip is the flip chip form with the solder ball and it is mountable in the SMT production line. It is unnecessary the wire bonding, it can achieve high mass productivity up to high frequency range.

## Features

- Low Cost Surface Mount Type Device
- Flip Chip Form with Solder Ball  
Solder Ball Diameter: 165  $\mu\text{m}$   
Solder Ball Pitch: 400 $\mu\text{m}$
- Applicable from C to E-Band application.
- Small Size
- Highly Integrated
- Chip Level Protection against Humidity
- RoHS Compliance

## ◆Process

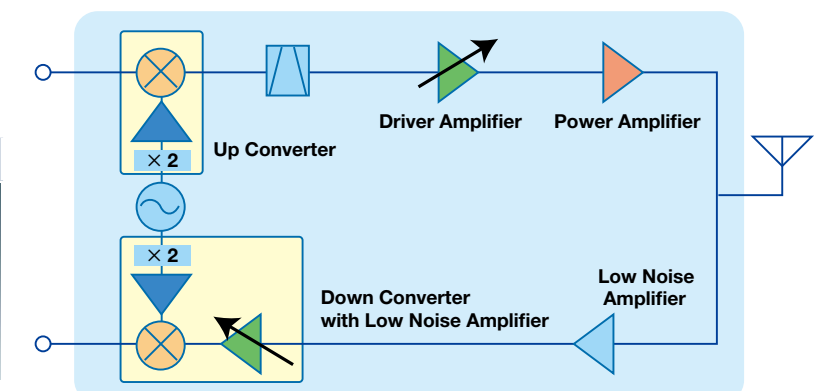
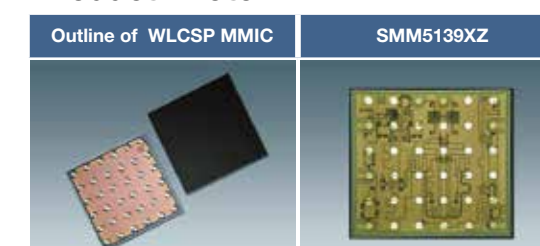


## Product Lineup

|                | 13/15GHz              | 18/23GHz   | 24/30GHz   | Spec |
|----------------|-----------------------|------------|------------|------|
| Low Noise Amp  | SMM5722XZ             | SMM5723XZ* | SMM5724XZ* | P17  |
| Up Converter   | SMM5138XZ / SMM5145XZ | SMM5141XZ* | SMM5143XZ* | P19  |
| Down Converter | SMM5139XZ / SMM5146XZ | SMM5142XZ  | SMM5144XZ* | P19  |

\*Under Development

## Product Photo

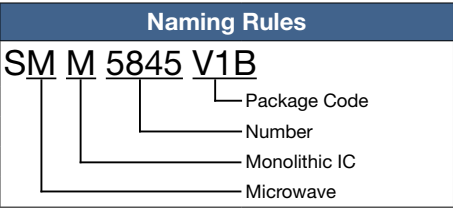


C to Ka Band Power Amplifier MMICs (Packages)

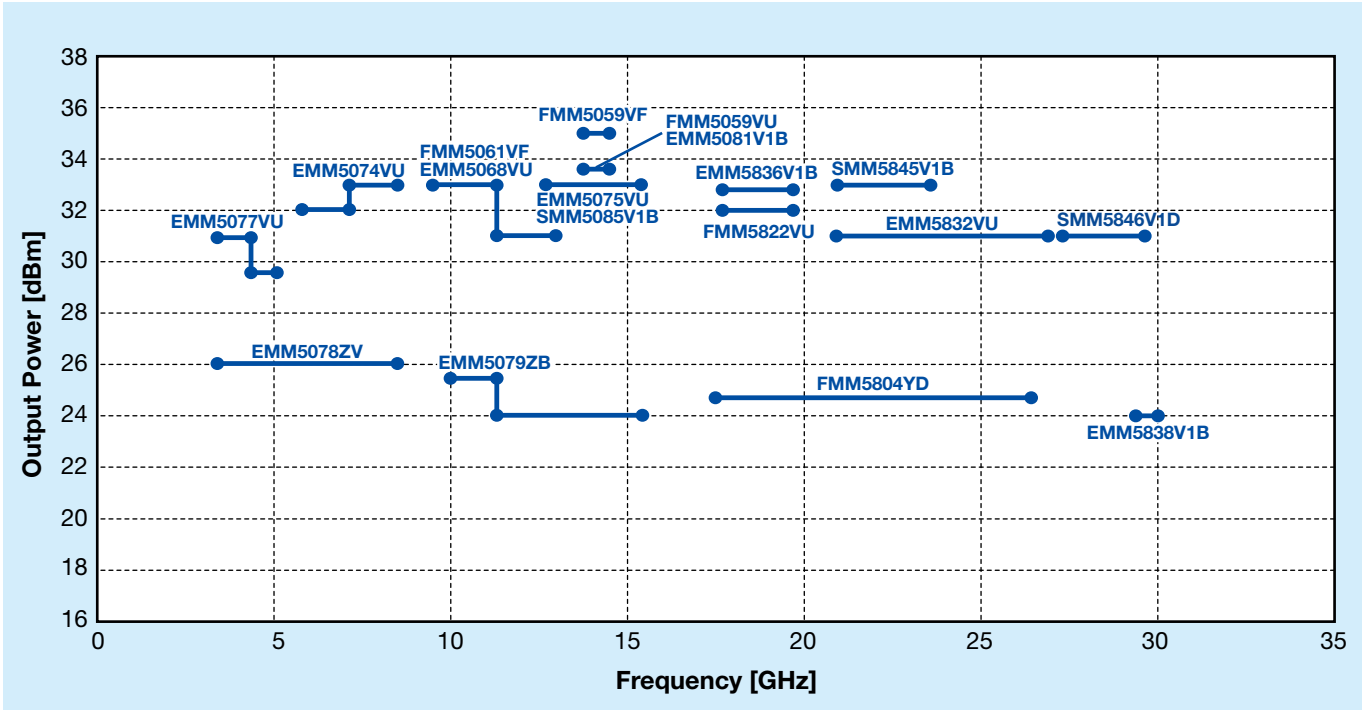
C to Ka Band Power Amplifier MMICs (Packages)

Sumitomo Electric provides GaAs power amplifier MMICs mounted in a suitable high frequency package with output power 50mW - 2W at frequencies ranging from C-band to Ka-band. Sumitomo Electric provides various types of packages including highly reliable hermetically sealed types, low cost surface mount types and very low cost QFN types. These MMICs can be packaged to meet the customer's cost/performance requirements.

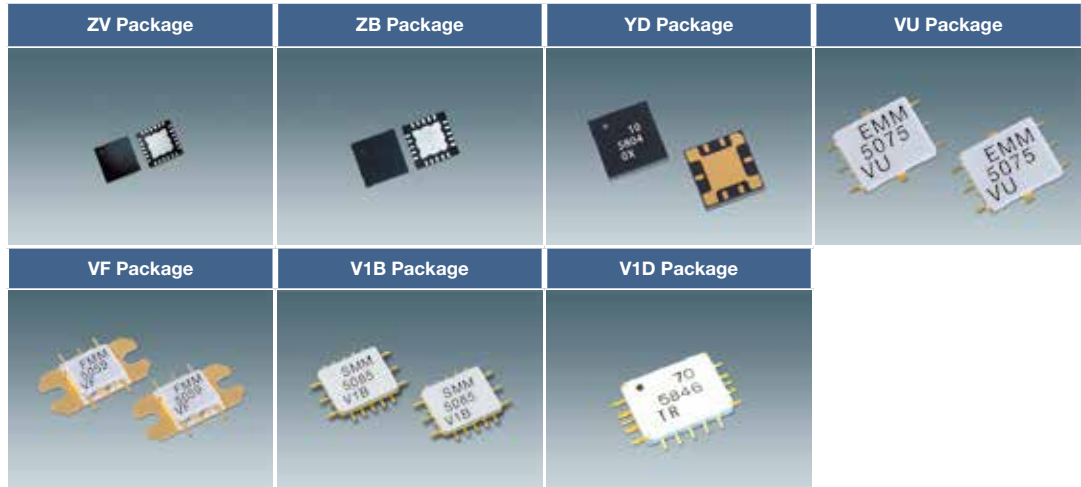
- Features**
- Input and Output Internally Matched  $Z_{in}/Z_{out} = 50\Omega$
  - High Output Power (Up to 2W)
  - High Gain
  - Low Distortion
  - Small Hermetically Sealed Package (V1B/V1D/VU/VF)
  - Low Cost Surface Mount Package (ZV/ZB/V1B/V1D/VU/YD)



◆Power Amplifier MMIC Lineup (Package)



Product Photo



Specifications

| Part Number | Frequency Range f (GHz) | Output Power at 1dB G.C.P. P1dB dBm (Typ.) | Gain at 1dB G.C.P. G1dB dB (Typ.)         | 3rd. Order Intercept Point OIP3 dBm (Typ.) | Drain-Source Voltage VDD (V) | Drain Current at 1dB G.C.P. IDD mA (Typ.)     | Outline/Package Code | Function/ Application                                   |
|-------------|-------------------------|--------------------------------------------|-------------------------------------------|--------------------------------------------|------------------------------|-----------------------------------------------|----------------------|---------------------------------------------------------|
| EMM5078ZV   | 3.4–8.5                 | 26                                         | 29                                        | 35                                         | 6                            | 350                                           | ZV                   | Driver Amp., LO Buffer Amp. C-Band VSAT and Radio Link  |
| EMM5077VU   | 3.4–5.0                 | 31 (f=3.4–4.2GHz)<br>29.5 (f=4.2–5.0GHz)   | 25                                        | 39.5 (f=3.4–4.2GHz)<br>38 (f=4.2–5.0GHz)   | 6                            | 1200 (f=3.4–4.2GHz)<br>1250 (f=4.2–5.0GHz)    | VU                   | Power Amp. Radio Link                                   |
| EMM5074VU   | 5.8–8.5                 | 32 (f=5.8–7.1GHz)<br>33 (f=7.1–8.5GHz)     | 26                                        | 41                                         | 6                            | 1400 (f=5.8–7.1GHz)<br>1450 (f=7.1–8.5GHz)    | VU                   | Power Amp. C-Band VSAT and Radio Link                   |
| FMM5056VF   | 5.8–7.2                 | 34                                         | 28                                        | -                                          | 10                           | 1100                                          | VF                   | Power Amp. Radio Link                                   |
| FMM5057VF   | 7.1–8.5                 | 34                                         | 26                                        | -                                          | 10                           | 1100                                          | VF                   |                                                         |
| EMM5068VU   | 9.5–13.3                | 33 (f=9.5–11.7GHz)<br>31 (f=11.7–13.3GHz)  | 25 (f=9.5–11.7GHz)<br>23 (f=11.7–13.3GHz) | 40                                         | 6                            | 1500 (f=9.5–11.7GHz)<br>1400 (f=11.7–13.3GHz) | VU                   |                                                         |
| FMM5061VF   | 9.5–13.3                | 33 (f=9.5–11.7GHz)<br>31 (f=11.7–13.3GHz)  | 26 (f=9.5–11.7GHz)<br>24 (f=11.7–13.3GHz) | 41.5                                       | 6                            | 1700 (f=9.5–11.7GHz)<br>1500 (f=11.7–13.3GHz) | VF                   | Driver Amp., LO Buffer Amp. Ku-Band VSAT and Radio Link |
| EMM5079ZB   | 10–15.4                 | 25.5 (f=10–11.7GHz)<br>24 (f=11.7–15.4GHz) | 22                                        | 31 (f=10–11.7GHz)<br>35 (f=11.7–15.4GHz)   | 6                            | 380                                           | ZB                   |                                                         |
| EMM5075VU   | 12.7–15.4               | 33                                         | 25                                        | 42                                         | 6                            | 1500                                          | VU                   |                                                         |
| SMM5085V1B  | 12.7–15.4               | 32.5                                       | 24                                        | 42                                         | 6                            | 1500                                          | V1B                  | Power Amp. Radio Link IC                                |
| EMM5081V1B  | 13.75–14.5              | 33.5                                       | 29                                        | 39.5                                       | 6                            | 1400                                          | V1B                  | Power Amp. Ku-Band VSAT                                 |
| FMM5059VU   | 13.75–14.5              | 33.5                                       | 29                                        | 39.5                                       | 6                            | 1400                                          | VU                   |                                                         |
| FMM5059VF   | 13.75–14.5              | 35                                         | 28                                        | 40                                         | 7                            | 1600                                          | VF                   |                                                         |
| FMM5804YD   | 17.5–26.5               | 24.5                                       | 16                                        | -                                          | 6                            | 350                                           | YD                   | Driver Amp. Ka-Band VSAT and Radio Link                 |
| FMM5822VU   | 17.7–19.7               | 32                                         | 21                                        | 38.5                                       | 6                            | 1100                                          | VU                   | Power Amp. Radio Link                                   |
| EMM5836V1B  | 17.7–19.7               | 32.5                                       | 26                                        | 40                                         | 6                            | 1800                                          | V1B                  |                                                         |
| SMM5845V1B  | 21.2–23.6               | 33                                         | 21                                        | 41                                         | 6                            | 1800                                          | V1B                  |                                                         |
| EMM5832VU   | 21.2–26.5               | 31                                         | 19                                        | 36.5                                       | 6                            | 1000                                          | VU                   |                                                         |
| SMM5846V1D  | 27.5–29.5               | 31                                         | 19                                        | 39                                         | 6                            | 1450                                          | V1D                  | Power Amp. Ka-Band VSAT                                 |
| EMM5838V1B  | 29.5–30.0               | 26                                         | 24                                        | -                                          | 6                            | 280                                           | V1B                  |                                                         |

G.C.P.: Gain Compression Point

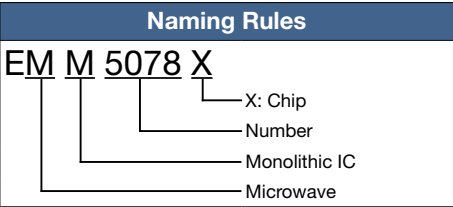
# C to V Band Power Amplifier MMICs (Chip)

# C to V Band Power Amplifier MMICs (Chip)

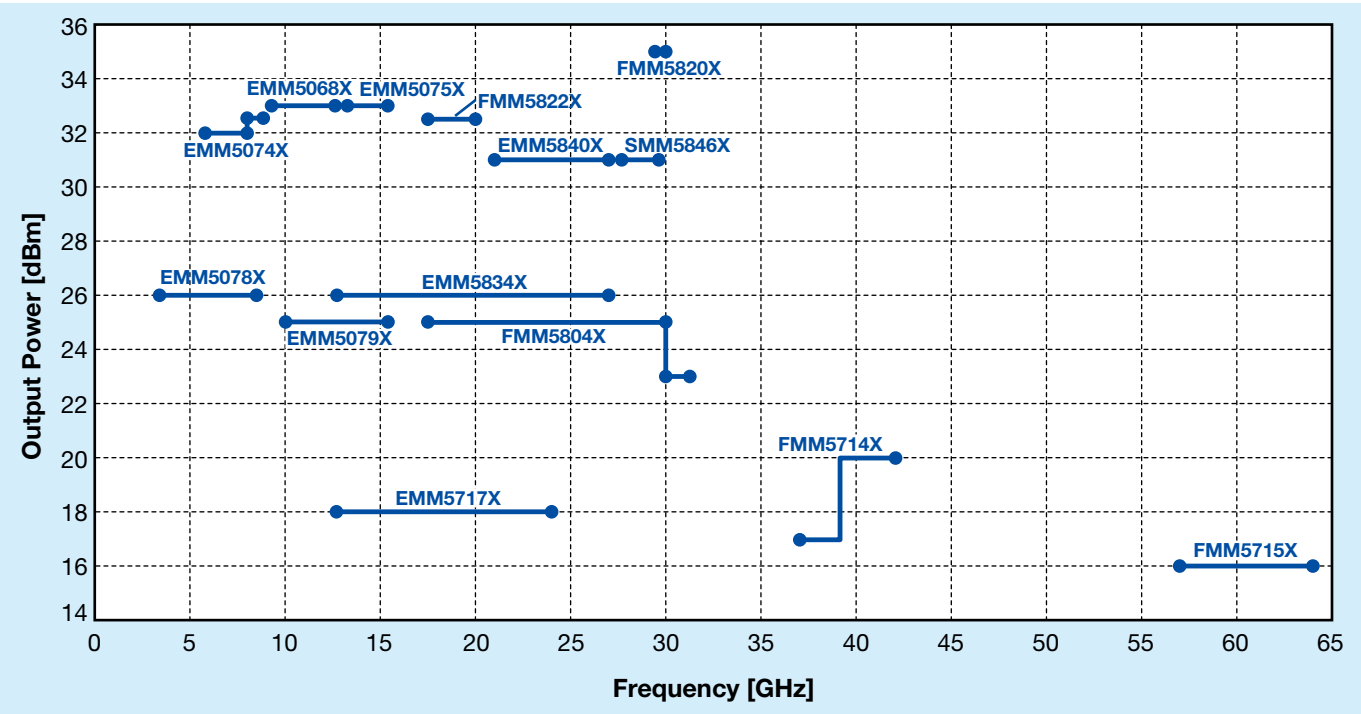
Sumitomo Electric is providing a full line-up of GaAs power amplifier MMIC chips with output power at 50mW to 3W. These MMICs are designed for VSAT (Very Small Aperture Terminal) and radio link transmitter applications that require high power, high gain and low distortion in a 50Ω system. Sumitomo Electric has a full line-up of MMIC products specified from C-band through V-band.

Features

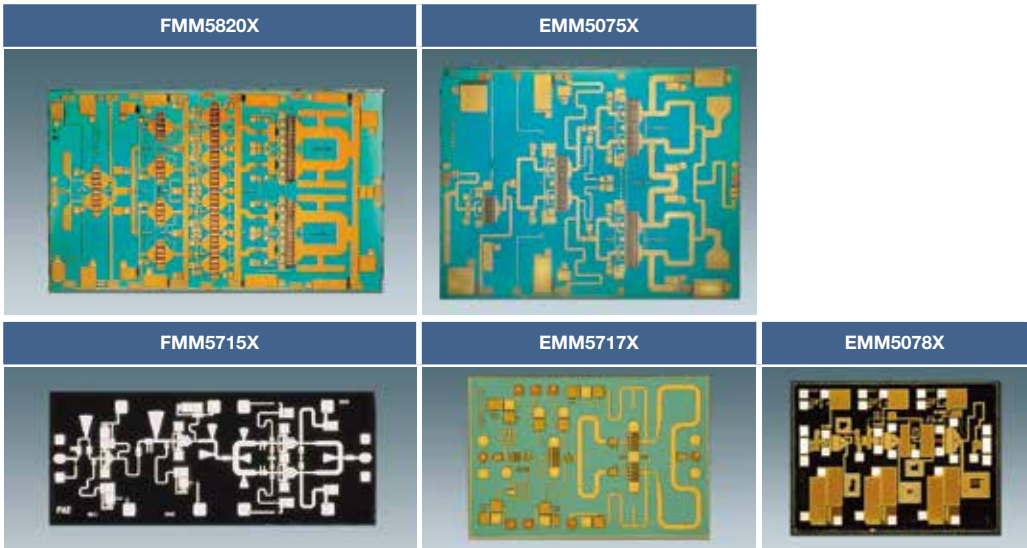
- Input and Output Internally Matched  $Z_{in}/Z_{out} = 50\Omega$
- High Output Power (Up to 3W)
- High Gain
- Low Distortion
- High Reliability



◆Power Amplifier MMIC Lineup (Chip)



Product Photo



Specifications

Ta=+25°C

| Part Number | Frequency Range f (GHz) | Output Power at 1dB G.C.P. P1dB dBm (Typ.) | Gain at 1dB G.C.P. G1dB dB (Typ.) | 3rd. Order Intercept Point OIP3 dBm (Typ.) | Drain-Source Voltage VDD (V) | Drain Current at 1dB G.C.P. IDD mA (Typ.) | Function/Application                                    |
|-------------|-------------------------|--------------------------------------------|-----------------------------------|--------------------------------------------|------------------------------|-------------------------------------------|---------------------------------------------------------|
| EMM5078X    | 3.4–8.5                 | 26                                         | 29                                | 35                                         | 6                            | 350                                       | Driver Amp., LO Buffer Amp. C-Band VSAT and Radio Link  |
| EMM5074X    | 5.8–8.5                 | 32 (f=5.8–7.1GHz)<br>32.5 (f=7.1–8.5GHz)   | 27                                | 41                                         | 6                            | 1450                                      | Power Amp. C-Band VSAT and Radio Link                   |
| EMM5068X    | 9.5–13.3                | 33                                         | 25                                | 42.5                                       | 6                            | 1500                                      | Power Amp. Radio Link                                   |
| EMM5079X    | 10–15.4                 | 25                                         | 22.5                              | 31 (f=10–11.7GHz)<br>35 (f=11.7–15.4GHz)   | 6                            | 350                                       | Driver Amp., LO Buffer Amp. Ku-Band VSAT and Radio Link |
| EMM5717X    | 12.7–24                 | 18                                         | 22                                | -                                          | 3                            | 180                                       | Power Amp. Ku-Band VSAT and Radio Link                  |
| EMM5834X    | 12.7–27                 | 26                                         | 23                                | 32.5                                       | 6                            | 370                                       |                                                         |
| EMM5075X    | 12.7–15.4               | 33                                         | 26                                | 43.5                                       | 6                            | 1300                                      | Power Amp. Ku-Band VSAT and Radio Link                  |
| FMM5804X    | 17.5–31.5               | 25 (f=17.5–30GHz)<br>23 (f=30–31.5GHz)     | 18                                | -                                          | 6                            | 300                                       | Driver Amp. Ka-Band VSAT and Radio Link                 |
| FMM5822X    | 17.5–20                 | 32.5                                       | 21                                | 41                                         | 6                            | 1000                                      | Power Amp. Radio Link                                   |
| EMM5840X    | 21–27                   | 31                                         | 24                                | 39                                         | 6                            | 1000                                      |                                                         |
| SMM5846X    | 27.5–29.5               | 31                                         | 19                                | 39                                         | 6                            | 1450                                      |                                                         |
| FMM5820X    | 29.5–30                 | 35                                         | 23                                | -                                          | 7                            | 2200                                      | Power Amp. Ka-Band VSAT and Radio Link                  |
| FMM5714X    | 37–42                   | 17 (f=37GHz)<br>20 (f=42GHz)               | 21                                | 26.5 (f=37GHz)<br>29 (f=42GHz)             | 3                            | 200                                       | Power Amp. Ku-Band VSAT                                 |
| FMM5715X    | 57–64                   | 16                                         | 17                                | -                                          | 3                            | 150                                       | Power Amp. Radio Link                                   |

G.C.P.: Gain Compression Point

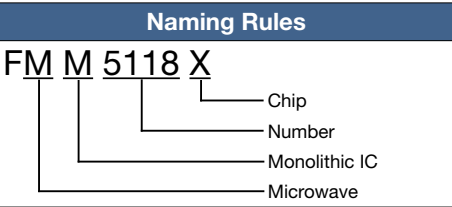
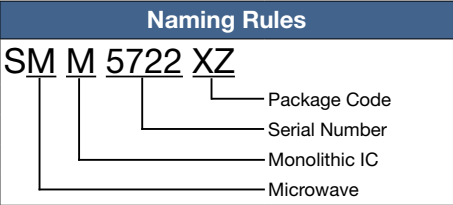
# Ku to V Band Low Noise Amplifier MMICs

# Ku to V Band Multiplier MMICs

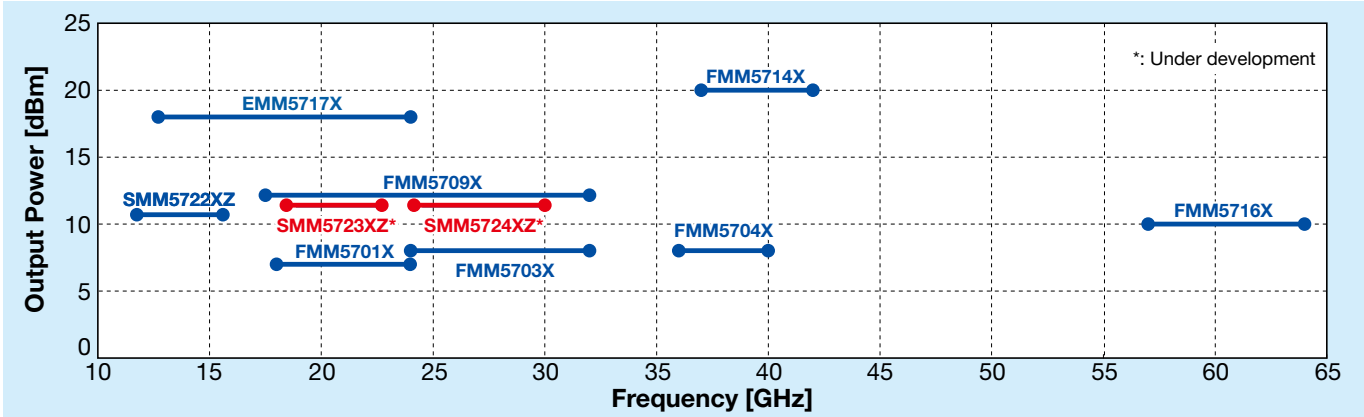
Sumitomo Electric provides GaAs Low Noise amplifier MMICs are designed for VSAT and radio link receiver applications. The performance of low noise figure and high associated gain are achieved using pHEMT technology and EB lithography process. Sumitomo Electric has line-ups of MMIC products specified from Ku-band through V-band.

Features

- Input and Output Internally Matched Zin/Zout = 50Ω
- Low Noise Figure
- High Gain
- Wide Band
- High Reliability Bare Die (X)
- Low Cost Surface Mount Device (XZ)



Low Noise Amplifier MMIC Lineup

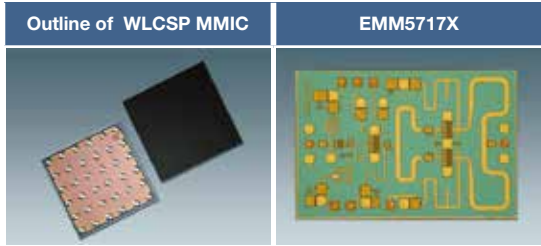


Specifications

| Part Number | Frequency Range f (GHz) | Drain-Source Voltage VDD (V) | Noise Figure NF dB (Typ.) | Associated Gain Gas dB (Typ.) | Output Power at 1dB G.C.P. P1dB dBm (Typ.) | Drain Current IDD mA (Typ.) | Outline/Package Code | Application         |
|-------------|-------------------------|------------------------------|---------------------------|-------------------------------|--------------------------------------------|-----------------------------|----------------------|---------------------|
| SMM5722XZ   | 12-16                   | 5                            | 2.3                       | 20                            | 11                                         | 30                          | WLCSP                | VSAT and Radio Link |
| EMM5717X    | 12.7-24                 | 3                            | 2.5                       | 23                            | 18                                         | 180                         | Chip                 |                     |
| FMM5709X    | 17.5-32                 | 3                            | 2.5                       | 23                            | 12.5                                       | 60                          | Chip                 |                     |
| SMM5723XZ*  | 17-23                   | 5                            | 2.7                       | 20                            | 12                                         | 35                          | WLCSP                |                     |
| FMM5701X    | 18-28                   | 5                            | 1.5                       | 13.5                          | 7                                          | 12                          | Chip                 |                     |
| FMM5703X    | 24-32                   | 3                            | 2                         | 18                            | 9                                          | 20                          | Chip                 |                     |
| SMM5724XZ*  | 24-30                   | 5                            | 3.2                       | 22                            | 14                                         | 80                          | WLCSP                |                     |
| FMM5704X    | 36-40                   | 3                            | 2                         | 18                            | 9                                          | 20                          | Chip                 |                     |
| FMM5714X    | 37-42                   | 3                            | 3                         | 22                            | 17 (f=37GHz)<br>20 (f=42GHz)               | 200                         | Chip                 |                     |
| FMM5716X    | 57-64                   | 3                            | 5                         | 22                            | 10                                         | 30                          | Chip                 |                     |

G.C.P.: Gain Compression Point  
\*Under Development

Product Photo



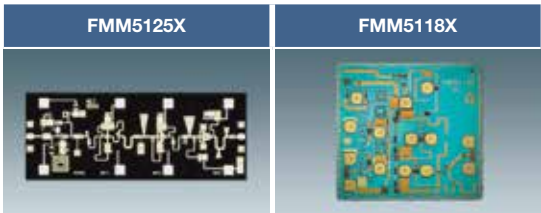
Features

- Low Cost Surface Mount Type Devices
- Flip Chip Form with Solder Ball  
Solder Ball Diameter : 140um  
Solder Ball Pitch : 300um
- Small size
- High integrated
- Chip Level Protection against Humidity
- RoHS Compliant

Specifications

| Part Number | RF Frequency Range f (GHz) | Drain-Source Voltage VDD (V) | Conversion Gain (dB) | Current Consumption (mA) | Function   |
|-------------|----------------------------|------------------------------|----------------------|--------------------------|------------|
| FMM5118X    | 20-32                      | 5                            | 14                   | 130                      | Doubler    |
| FMM5125X    | 57-64                      | 5                            | -5                   | 100                      | Quadrupler |

Product Photo

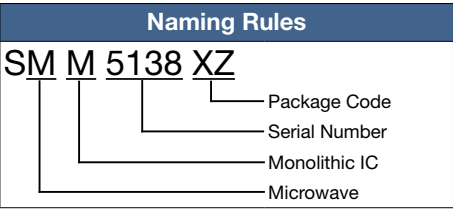


# Ku to Ka Band Converter MMICs

Sumitomo Electric provides Mixer MMICs that are designed for VSAT and radio link applications. These devices use an up-converter for the transmitter and a down-converter for the receiver. These MMICs include a local buffer amplifier integrated on MMIC chip.

### Features

- Wide Frequency Range
- High Conversion Gain
- High Integrated
- Low Distortion
- Low Cost Surface Mount Device (XZ)
- Flip Chip Form (XZ)



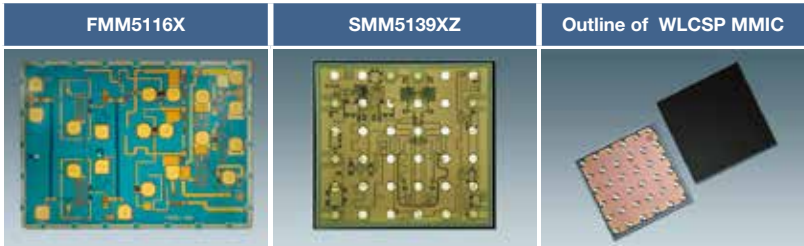
### Specifications

Ta=+25°C

| Part Number | RF Frequency Range f (GHz) | Drain-Source Voltage VDD (V) | Conversion Gain (dB) | Current Consumption (mA) | Outline/Package Code | Function                     |
|-------------|----------------------------|------------------------------|----------------------|--------------------------|----------------------|------------------------------|
| FMM5116X    | 20–32                      | 5                            | -10                  | 140                      | Chip                 | with Doubler, Up Converter   |
| SMM5138XZ   | 12–16                      | 5                            | -12                  | 35                       | WLCSP                | Up Converter                 |
| SMM5145XZ   | 12–16                      | 5                            | -12                  | 60                       | WLCSP                | with Doubler, Up Converter   |
| SMM5139XZ   | 12–16                      | 5                            | +10                  | 75                       | WLCSP                | Down Converter               |
| SMM5146XZ   | 12–16                      | 5                            | +10                  | 95                       | WLCSP                | with Doubler, Down Converter |
| SMM5141XZ*  | 18–23                      | 5                            | -12                  | 100                      | WLCSP                | with Doubler, Up Converter   |
| SMM5142XZ   | 18–23                      | 5                            | +10                  | 135                      | WLCSP                | with Doubler, Down Converter |
| SMM5143XZ*  | 24–30                      | 5                            | -12                  | 100                      | WLCSP                | with Doubler, Up Converter   |
| SMM5144XZ*  | 24–30                      | 5                            | +12                  | 210                      | WLCSP                | with Doubler, Down Converter |

\*Under Development

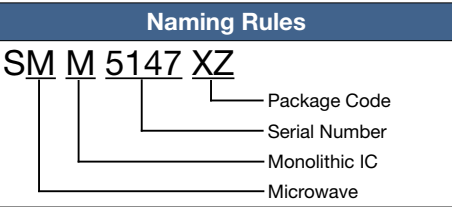
### Product Photo



# E-Band MMICs

### Features

- Low Cost Surface Mount Type Devices
- Flip Chip Form with Solder Ball  
Solder Ball Diameter : 140um  
Solder Ball Pitch : 300um
- Small size
- High integrated
- Chip Level Protection against Humidity
- RoHS Compliance



### Converters

| Part Number | Frequency Range f (GHz) | Conversion Gain (dB) | Drain-Source Voltage VDD (V) | Current Consumption (mA) | Outline/Package Code | Function/ Application |
|-------------|-------------------------|----------------------|------------------------------|--------------------------|----------------------|-----------------------|
| SMM5147XZ*  | 71–86                   | -15                  | 6                            | 65                       | WLCSP                | Up Converter          |
| SMM5148XZ*  |                         | -15                  |                              | 65                       | WLCSP                | Down Converter        |

### Multiplier

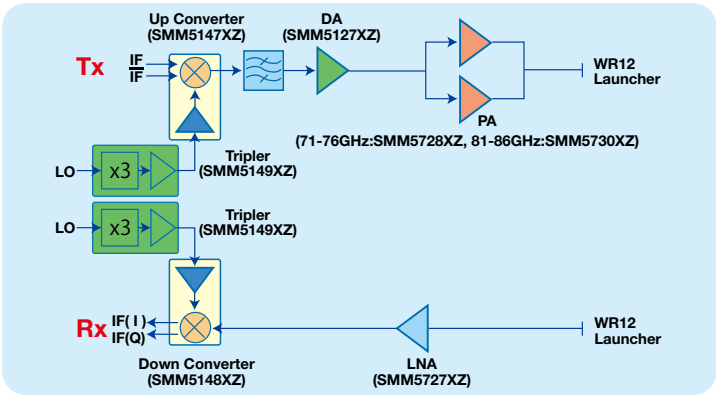
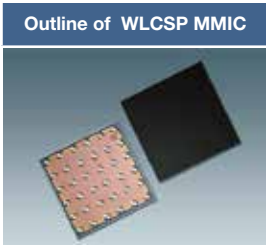
| Part Number | Frequency Range f (GHz) | Conversion Gain (dB) | Drain-Source Voltage VDD (V) | Current Consumption (mA) | Outline/Package Code | Function/ Application |
|-------------|-------------------------|----------------------|------------------------------|--------------------------|----------------------|-----------------------|
| SMM5149XZ*  | 65–92                   | -3                   | 6                            | 55                       | WLCCSP               | Tripler               |

### PA and LNAs

| Part Number | Frequency Range<br>f<br>(GHz) | Noise Figure<br>NF<br>dB(Typ.) | Gain<br>at 1dB G.C.P.<br>G1dB<br>dB(Typ.) | Output Power<br>at 1dB G.C.P.<br>P1dB<br>dBm(Typ.) | Drain-Source<br>Voltage<br>VDD<br>(V) | Drain<br>Current<br>IDD<br>mA<br>(Typ.) | Outline/<br>Package<br>Code | Function/<br>Application |
|-------------|-------------------------------|--------------------------------|-------------------------------------------|----------------------------------------------------|---------------------------------------|-----------------------------------------|-----------------------------|--------------------------|
| SMM5727XZ*  | 71-86                         | 5(71-76GHz)<br>5.5(81-86GHz)   | 20.5(71-76GHz)<br>18(81-86GHz)            | 12(71-76GHz)<br>11(81-86GHz)                       | 6                                     | 60                                      | WLCSP                       | LNA and DA               |
| SMM5728XZ*  | 71-76                         | -                              | 24                                        | 19                                                 |                                       | 410                                     |                             | PA                       |
| SMM5730XZ*  | 81-86                         | -                              | 27                                        | 18                                                 |                                       |                                         |                             |                          |

\*: Under Development

### Product Photo



# Internally Matched High Power GaAs FETs

# Internally Matched High Power GaAs FETs

FLM/ELM/SLM Series are internally matched power GaAs FETs developed for radio link applications which require high power, high gain, and low distortion in a 50Ω system that are available from 2GHz to 15.3GHz frequency bands.

PS-series are cost effective products of plastic package which can be surface-mounted to save assembly cost. These products can be provided in both taping-reel and Tray.

Features: PS series

- Input/Output Internally Matched
- Plastic Package for SMT Applications (I2C)
- High Gain
- High Output Power
- High PAE
- Frequency Bands (5.9 to 6.4GHz, 6.4 to 7.2GHz, 7.1 to 7.9GHz, 7.7 to 8.5GHz)

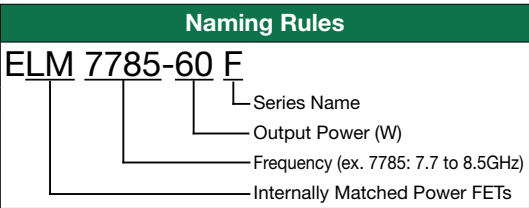
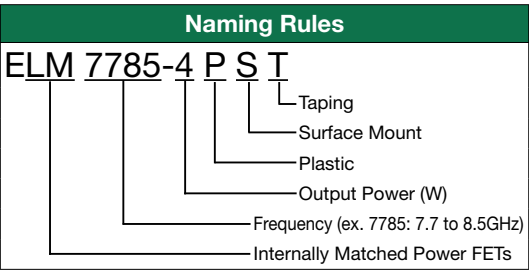
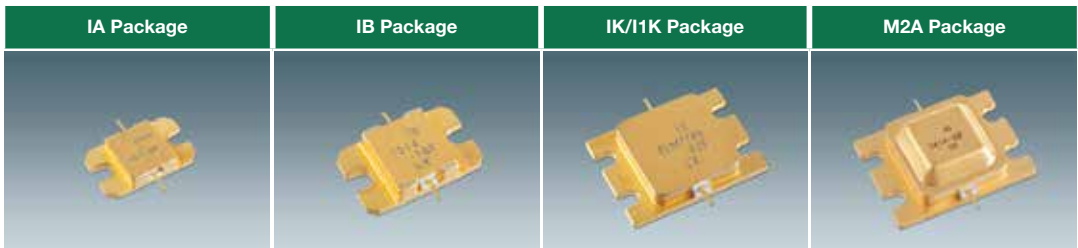
Product Photo



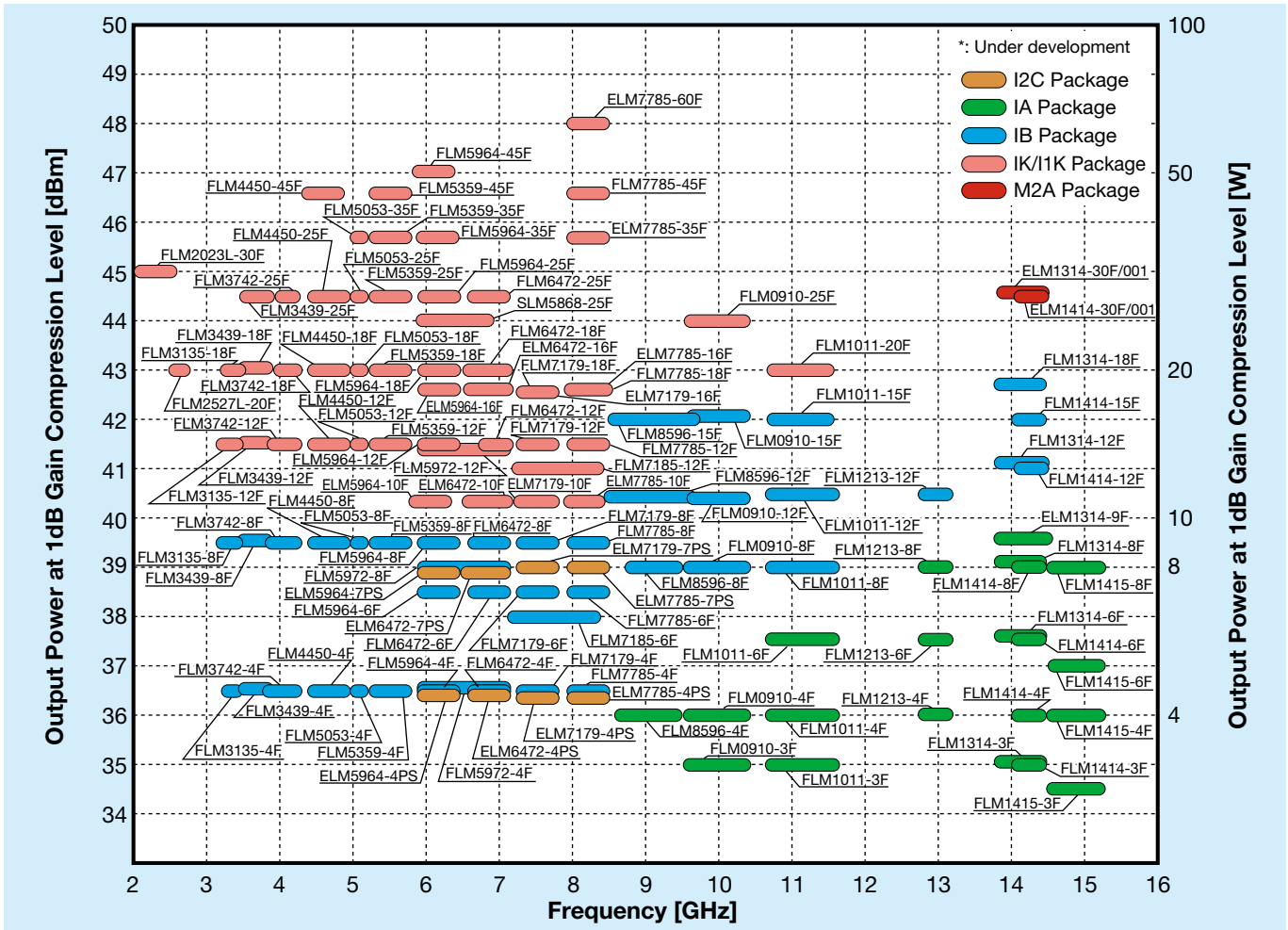
Features

- Input/Output Internally Matched  $Z_{in}/Z_{out} = 50\Omega$
- Hermetic Metal Wall Package
- High Gain
- High Output Power (Up to 60W)
- Low Distortion
- Covers Wide Band

Product Photo



Internally Matched High Power GaAs FET Lineup



Specifications: PS series

| Part Number | Frequency Band | 2tone test     |                         | P1dB Typ. (dBm) | G1dB Typ. (dB) | ηadd Typ. (%) | Frequency f (GHz) | VDS Typ. (V) | IDS(RF) Typ. (mA) | Rth Typ. (°C/W) | Outline/ Package Code | Feature/ Application                                        |
|-------------|----------------|----------------|-------------------------|-----------------|----------------|---------------|-------------------|--------------|-------------------|-----------------|-----------------------|-------------------------------------------------------------|
|             |                | IM3 Typ. (dBc) | @Pout S.C.L. Typ. (dBm) |                 |                |               |                   |              |                   |                 |                       |                                                             |
| ELM5964-4PS | C              | -43            | 25.5                    | 36              | 11.5           | 37            | 5.9-6.4           | 10           | 1100              | 4.5             | I2C                   | • Internally matched<br>• Optimized for each frequency band |
| ELM5964-7PS | C              | -45            | 28                      | 39              | 11             | 36            | 5.9-6.4           | 10           | 2200              | 2.5             | I2C                   |                                                             |
| ELM6472-4PS | C              | -43            | 25.5                    | 36              | 11             | 36            | 6.4-7.2           | 10           | 1100              | 4.5             | I2C                   |                                                             |
| ELM6472-7PS | C              | -43            | 28                      | 39              | 10.5           | 35            | 6.4-7.2           | 10           | 2200              | 2.5             | I2C                   |                                                             |
| ELM7179-4PS | C              | -43            | 25.5                    | 36              | 10.5           | 35            | 7.1-7.9           | 10           | 1100              | 4.5             | I2C                   |                                                             |
| ELM7179-7PS | C              | -43            | 28                      | 39              | 10             | 34            | 7.1-7.9           | 10           | 2200              | 2.5             | I2C                   |                                                             |
| ELM7785-4PS | C              | -43            | 25.5                    | 36              | 10             | 34            | 7.7-8.5           | 10           | 1100              | 4.5             | I2C                   |                                                             |
| ELM7785-7PS | C              | -43            | 28                      | 39              | 9.5            | 33            | 7.7-8.5           | 10           | 2200              | 2.5             | I2C                   |                                                             |

Internally Matched High Power GaAs FETs

Internally Matched High Power GaAs FETs

Specifications

| Part Number     | Frequency Band | 2tone test     |                         | P1dB Typ. (dBm) | G1dB Typ. (dB) | $\eta$ add Typ. (%) | Frequency f (GHz) | VDS Typ. (V) | IDS(RF) Typ. (mA) | Rth Typ. (°C/W) | Outline/ Package Code | Feature/ Application                                                                      |
|-----------------|----------------|----------------|-------------------------|-----------------|----------------|---------------------|-------------------|--------------|-------------------|-----------------|-----------------------|-------------------------------------------------------------------------------------------|
|                 |                | IM3 Typ. (dBc) | @Pout S.C.L. Typ. (dBm) |                 |                |                     |                   |              |                   |                 |                       |                                                                                           |
| FLM2023L-30F    | L              | -45            | 34.5                    | 45              | 13             | 43                  | 2,025-2,285       | 10           | 7000              | 1.2             | IK                    | • 50Ω internally matched<br>• No external matching<br>• Optimized for each frequency band |
| FLM2527L-20F    | L              | -              | -                       | 43              | 11             | 38                  | 2.5-2.7           | 10           | 4800              | 1.6             | IK                    |                                                                                           |
| FLM3135-4F      | S              | -45            | 25.5                    | 36.5            | 12             | 38                  | 3.1-3.5           | 10           | 1100              | 5               | IB                    |                                                                                           |
| FLM3135-8F      | S              | -45            | 28.5                    | 39.5            | 11             | 37                  | 3.1-3.5           | 10           | 2200              | 3               | IB                    |                                                                                           |
| FLM3135-12F     | S              | -45            | 30.5                    | 41.5            | 11.5           | 40                  | 3.1-3.5           | 10           | 3250              | 2.3             | IK                    |                                                                                           |
| FLM3135-18F     | S              | -45            | 32.0                    | 43              | 10.5           | 37                  | 3.1-3.5           | 10           | 4800              | 1.6             | IK                    |                                                                                           |
| FLM3439-4F      | S              | -46            | 25.5                    | 36.5            | 12             | 38                  | 3.4-3.9           | 10           | 1100              | 5               | IB                    |                                                                                           |
| FLM3439-8F      | S              | -46            | 28.5                    | 39.5            | 11             | 37                  | 3.4-3.9           | 10           | 2200              | 3               | IB                    |                                                                                           |
| FLM3439-12F     | S              | -46            | 30.5                    | 41.5            | 11.5           | 40                  | 3.4-3.9           | 10           | 3250              | 2.3             | IK                    |                                                                                           |
| FLM3439-18F     | S              | -46            | 32.0                    | 43              | 10.5           | 37                  | 3.4-3.9           | 10           | 4800              | 1.6             | IK                    |                                                                                           |
| FLM3439-25F     | S              | -46            | 33.5                    | 44.5            | 10.5           | 41                  | 3.4-3.9           | 10           | 6200              | 1.4             | IK                    |                                                                                           |
| FLM3742-4F      | C              | -46            | 25.5                    | 36.5            | 12             | 38                  | 3.7-4.2           | 10           | 1100              | 5               | IB                    |                                                                                           |
| FLM3742-8F      | C              | -46            | 28.5                    | 39.5            | 11             | 37                  | 3.7-4.2           | 10           | 2200              | 3               | IB                    |                                                                                           |
| FLM3742-12F     | C              | -46            | 30.5                    | 41.5            | 11.5           | 40                  | 3.7-4.2           | 10           | 3250              | 2.3             | IK                    |                                                                                           |
| FLM3742-18F     | C              | -46            | 32.0                    | 43              | 10.5           | 37                  | 3.7-4.2           | 10           | 4800              | 1.6             | IK                    |                                                                                           |
| FLM3742-25F     | C              | -46            | 33.5                    | 44.5            | 10.5           | 41                  | 3.7-4.2           | 10           | 6200              | 1.4             | IK                    |                                                                                           |
| FLM4450-4F      | C              | -46            | 25.5                    | 36.5            | 11             | 37                  | 4.4-5.0           | 10           | 1100              | 5               | IB                    |                                                                                           |
| FLM4450-8F      | C              | -46            | 28.5                    | 39.5            | 10             | 36                  | 4.4-5.0           | 10           | 2200              | 3               | IB                    |                                                                                           |
| FLM4450-12F     | C              | -46            | 30.5                    | 41.5            | 10.5           | 39                  | 4.4-5.0           | 10           | 3250              | 2.3             | IK                    |                                                                                           |
| FLM4450-18F     | C              | -46            | 32.0                    | 43              | 9.5            | 36                  | 4.4-5.0           | 10           | 4800              | 1.6             | IK                    |                                                                                           |
| FLM4450-25F     | C              | -46            | 33.5                    | 44.5            | 9.5            | 40                  | 4.4-5.0           | 10           | 6200              | 1.4             | IK                    |                                                                                           |
| FLM4450-45F     | C              | -              | -                       | 46.5            | 10             | 41                  | 4.4-5.0           | 12           | 8000              | 1.1             | IK                    |                                                                                           |
| FLM5053-4F      | C              | -46            | 25.5                    | 36.5            | 10.5           | 37                  | 5.0-5.3           | 10           | 1100              | 5               | IB                    |                                                                                           |
| FLM5053-8F      | C              | -46            | 28.5                    | 39.5            | 9.5            | 36                  | 5.0-5.3           | 10           | 2200              | 3               | IB                    |                                                                                           |
| FLM5053-12F     | C              | -46            | 30.5                    | 41.5            | 9.5            | 38                  | 5.0-5.3           | 10           | 3250              | 2.3             | IK                    |                                                                                           |
| FLM5053-18F     | C              | -46            | 32.0                    | 43              | 8.5            | 35                  | 5.0-5.3           | 10           | 4800              | 1.6             | IK                    |                                                                                           |
| FLM5053-25F     | C              | -46            | 33.5                    | 44.5            | 8.5            | 39                  | 5.0-5.3           | 10           | 6200              | 1.4             | IK                    |                                                                                           |
| FLM5053-35F     | C              | -45            | 34.5                    | 45.5            | 8              | 35                  | 5.0-5.3           | 10           | 8000              | 1.1             | IK                    |                                                                                           |
| FLM5359-4F      | C              | -46            | 25.5                    | 36.5            | 10.5           | 37                  | 5.3-5.9           | 10           | 1100              | 5               | IB                    |                                                                                           |
| FLM5359-8F      | C              | -46            | 28.5                    | 39.5            | 9.5            | 36                  | 5.3-5.9           | 10           | 2200              | 3               | IB                    |                                                                                           |
| FLM5359-12F     | C              | -46            | 30.5                    | 41.5            | 9.5            | 38                  | 5.3-5.9           | 10           | 3250              | 2.3             | IK                    |                                                                                           |
| FLM5359-18F     | C              | -46            | 32.0                    | 43              | 8.5            | 35                  | 5.3-5.9           | 10           | 4800              | 1.6             | IK                    |                                                                                           |
| FLM5359-25F     | C              | -46            | 33.5                    | 44.5            | 8.5            | 39                  | 5.3-5.9           | 10           | 6200              | 1.4             | IK                    |                                                                                           |
| FLM5359-35F     | C              | -              | -                       | 45.5            | 9              | 35                  | 5.3-5.9           | 10           | 8500              | 1.1             | IK                    |                                                                                           |
| FLM5359-45F     | C              | -              | -                       | 46.5            | 8.5            | 36                  | 5.3-5.9           | 12           | 8500              | 0.8             | IK                    |                                                                                           |
| FLM5964-4F      | C              | -46            | 25.5                    | 36.5            | 10             | 37                  | 5.9-6.4           | 10           | 1100              | 5               | IB                    |                                                                                           |
| FLM5964-6F      | C              | -46            | 27.5                    | 38.5            | 10             | 37                  | 5.9-6.4           | 10           | 1625              | 4               | IB                    |                                                                                           |
| FLM5964-8F      | C              | -46            | 28.5                    | 39.5            | 10             | 37                  | 5.9-6.4           | 10           | 2200              | 3               | IB                    |                                                                                           |
| ELM5964-10F     | C              | -46            | 29                      | 40.5            | 10             | 39                  | 5.9-6.4           | 10           | 2600              | 3               | IK                    |                                                                                           |
| FLM5964-12F     | C              | -46            | 30.5                    | 41.5            | 10             | 37                  | 5.9-6.4           | 10           | 3250              | 2.3             | IK                    |                                                                                           |
| ELM5964-16F     | C              | -45            | 31.5                    | 42.5            | 10             | 40                  | 5.9-6.4           | 10           | 4000              | 2.7             | IK                    |                                                                                           |
| FLM5964-18F     | C              | -46            | 32.0                    | 43              | 10             | 37                  | 5.9-6.4           | 10           | 4875              | 1.6             | IK                    |                                                                                           |
| FLM5964-25F     | C              | -46            | 33.5                    | 44.5            | 10             | 37                  | 5.9-6.4           | 10           | 6500              | 1.4             | IK                    |                                                                                           |
| FLM5964-35F     | C              | -40            | 35.0                    | 45.5            | 9              | 36                  | 5.9-6.4           | 10           | 8500              | 1.1             | IK                    |                                                                                           |
| FLM5964-45F     | C              | -40            | 35.5                    | 47              | 8.5            | 39                  | 5.9-6.4           | 10           | 11000             | 1.1             | IK                    |                                                                                           |
| FLM5964-4F/001  | C              | -45            | 25.5                    | 36.5            | 9.5            | 36                  | 5.85-6.75         | 10           | 1100              | 5               | IB                    |                                                                                           |
| FLM5964-8F/001  | C              | -45            | 28.5                    | 39.5            | 9              | 35                  | 5.85-6.75         | 10           | 2200              | 3               | IB                    |                                                                                           |
| FLM5964-12F/001 | C              | -45            | 30.5                    | 41.5            | 9              | 37                  | 5.85-6.75         | 10           | 3250              | 2.3             | IK                    |                                                                                           |
| FLM5964-18F/001 | C              | -45            | 31.5                    | 42.5            | 9              | 35                  | 5.85-6.75         | 10           | 4400              | 1.6             | IK                    |                                                                                           |
| SLM5868-25F     | C              | -45            | 33.0                    | 44.0            | 9              | 34                  | 5.85-6.75         | 10           | 6500              | 1.4             | IK                    |                                                                                           |
| FLM5972-4F      | C              | -45            | 25.5                    | 36.5            | 9.5            | 36                  | 5.9-7.2           | 10           | 1100              | 5               | IB                    |                                                                                           |
| FLM5972-8F      | C              | -45            | 28.0                    | 39.0            | 8.5            | 31                  | 5.9-7.2           | 10           | 2200              | 3               | IB                    |                                                                                           |
| FLM5972-12F     | C              | -45            | 30.5                    | 41.5            | 9.5            | 37                  | 5.9-7.2           | 10           | 3250              | 2.3             | IK                    |                                                                                           |
| FLM6472-4F      | C              | -46            | 25.5                    | 36.5            | 9.5            | 36                  | 6.4-7.2           | 10           | 1100              | 5               | IB                    |                                                                                           |
| FLM6472-6F      | C              | -46            | 27.5                    | 38.5            | 9.5            | 37                  | 6.4-7.2           | 10           | 1625              | 4               | IB                    |                                                                                           |
| FLM6472-8F      | C              | -46            | 28.5                    | 39.5            | 9.5            | 36                  | 6.4-7.2           | 10           | 2200              | 3               | IB                    |                                                                                           |
| ELM6472-10F     | C              | -46            | 29                      | 40.5            | 9.5            | 36                  | 6.4-7.2           | 10           | 2600              | 3               | IK                    |                                                                                           |
| FLM6472-12F     | C              | -46            | 30.5                    | 41.5            | 9.5            | 37                  | 6.4-7.2           | 10           | 3250              | 2.3             | IK                    |                                                                                           |
| ELM6472-16F     | C              | -45            | 31.5                    | 42.5            | 9.5            | 40                  | 6.4-7.2           | 10           | 4000              | 2.7             | IK                    |                                                                                           |
| FLM6472-18F     | C              | -46            | 32.0                    | 43              | 9.5            | 37                  | 6.4-7.2           | 10           | 4875              | 1.6             | IK                    |                                                                                           |
| FLM6472-25F     | C              | -46            | 33.5                    | 44.5            | 9.5            | 38                  | 6.4-7.2           | 10           | 6500              | 1.4             | IK                    |                                                                                           |

Note: Tc (op) = +25°C IM3: 3rd Order Intermodulation Distortion

Specifications

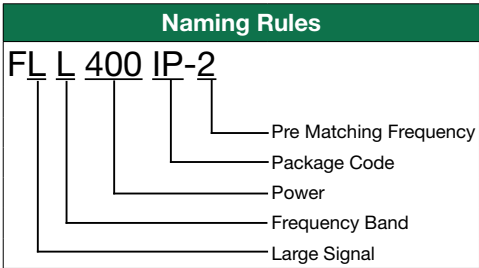
| Part Number     | Frequency Band | 2tone test     |                         | P1dB Typ. (dBm) | G1dB Typ. (dB) | $\eta$ add Typ. (%) | Frequency f (GHz) | VDS Typ. (V) | IDS(RF) Typ. (mA) | Rth Typ. (°C/W) | Outline/ Package Code | Feature/ Application                                                                                                                   |
|-----------------|----------------|----------------|-------------------------|-----------------|----------------|---------------------|-------------------|--------------|-------------------|-----------------|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------|
|                 |                | IM3 Typ. (dBc) | @Pout S.C.L. Typ. (dBm) |                 |                |                     |                   |              |                   |                 |                       |                                                                                                                                        |
| FLM7179-4F      | C              | -46            | 25.5                    | 36.5            | 9              | 35                  | 7.1-7.9           | 10           | 1100              | 5               | IB                    | <div>• 50<math>\Omega</math> internally matched</div> <div>• No external matching</div> <div>• Optimized for each frequency band</div> |
| FLM7179-6F      | C              | -46            | 27.5                    | 38.5            | 9              | 34                  | 7.1-7.9           | 10           | 1625              | 4               | IB                    |                                                                                                                                        |
| FLM7179-8F      | C              | -46            | 28.5                    | 39.5            | 9              | 35                  | 7.1-7.9           | 10           | 2200              | 3               | IB                    |                                                                                                                                        |
| ELM7179-10F     | C              | -46            | 29                      | 40.5            | 9              | 38                  | 7.1-7.9           | 10           | 2600              | 3               | IK                    |                                                                                                                                        |
| FLM7179-12F     | C              | -46            | 30.5                    | 41.5            | 9              | 38                  | 7.1-7.9           | 10           | 3250              | 2.3             | IK                    |                                                                                                                                        |
| ELM7179-16F     | C              | -43            | 31.5                    | 42.5            | 8.5            | 38                  | 7.1-7.9           | 10           | 4000              | 2.7             | IK                    |                                                                                                                                        |
| FLM7179-18F     | C              | -46            | 32.0                    | 42.5            | 8              | 30                  | 7.1-7.9           | 10           | 4875              | 1.6             | IK                    |                                                                                                                                        |
| FLM7185-6F      | C              | -45            | 27.0                    | 38.0            | 8              | 30                  | 7.1-8.5           | 10           | 1625              | 4               | IB                    |                                                                                                                                        |
| FLM7185-12F     | C              | -45            | 30.0                    | 41.0            | 8              | 30                  | 7.1-8.5           | 10           | 3250              | 2.3             | IK                    |                                                                                                                                        |
| FLM7785-4F      | C              | -46            | 25.5                    | 36.5            | 8.5            | 35                  | 7.7-8.5           | 10           | 1100              | 5               | IB                    |                                                                                                                                        |
| FLM7785-6F      | C              | -46            | 27.5                    | 38.5            | 8.5            | 31                  | 7.7-8.5           | 10           | 1750              | 4               | IB                    |                                                                                                                                        |
| FLM7785-8F      | C              | -46            | 28.5                    | 39.5            | 8.5            | 34                  | 7.7-8.5           | 10           | 2200              | 3               | IB                    |                                                                                                                                        |
| ELM7785-10F     | C              | -46            | 29                      | 40.5            | 8.5            | 37                  | 7.7-8.5           | 10           | 2600              | 3               | IK                    |                                                                                                                                        |
| FLM7785-12F     | C              | -46            | 30.5                    | 41.5            | 8.5            | 34                  | 7.7-8.5           | 10           | 3500              | 2.3             | IK                    |                                                                                                                                        |
| ELM7785-16F     | C              | -43            | 31.5                    | 42.5            | 8              | 37                  | 7.7-8.5           | 10           | 4000              | 2.7             | IK                    |                                                                                                                                        |
| FLM7785-18F     | C              | -45            | 31.5                    | 42.5            | 7              | 29                  | 7.7-8.5           | 10           | 4700              | 1.6             | IK                    |                                                                                                                                        |
| ELM7785-35F     | C              | -              | -                       | 45.5            | 8.5            | 35                  | 7.7-8.5           | 10           | 8500              | 1.1             | IK                    |                                                                                                                                        |
| FLM7785-45F     | C              | -              | -                       | 46.5            | 7              | 32.5                | 7.7-8.5           | 10           | 11000             | 1.1             | IK                    |                                                                                                                                        |
| ELM7785-60F     | C              | -              | -                       | 48.0            | 7              | 37                  | 7.7-8.5           | 10           | 13200             | 0.8             | 11K                   |                                                                                                                                        |
| FLM8596-4F      | X              | -45            | 25.5                    | 36.0            | 7.5            | 29                  | 8.5-9.6           | 10           | 1100              | 5               | IA                    |                                                                                                                                        |
| FLM8596-8F      | X              | -45            | 28.5                    | 39.0            | 7.5            | 29                  | 8.5-9.6           | 10           | 2200              | 3               | IB                    |                                                                                                                                        |
| FLM8596-12F     | X              | -45            | 29.5                    | 40.5            | 7.5            | 25                  | 8.5-9.6           | 10           | 3600              | 2.3             | IB                    |                                                                                                                                        |
| FLM8596-15F     | X              | -              | -                       | 42              | 7.5            | 32                  | 8.5-9.6           | 10           | 4000              | 2.3             | IB                    |                                                                                                                                        |
| FLM0910-3F      | X              | -46            | 24.0                    | 35              | 7.5            | 29                  | 9.5-10.5          | 10           | 825               | 5               | IA                    |                                                                                                                                        |
| FLM0910-4F      | X              | -46            | 25.5                    | 36              | 7.5            | 29                  | 9.5-10.5          | 10           | 1100              | 5               | IA                    |                                                                                                                                        |
| FLM0910-8F      | X              | -46            | 28.5                    | 39              | 7.5            | 29                  | 9.5-10.5          | 10           | 2200              | 3               | IB                    |                                                                                                                                        |
| FLM0910-12F     | X              | -              | -                       | 40.5            | 7              | 25                  | 9.5-10.5          | 10           | 3500              | 2.3             | IB                    |                                                                                                                                        |
| FLM0910-15F     | X              | -              | -                       | 42              | 7.5            | 32                  | 9.5-10.5          | 10           | 4000              | 2.3             | IB                    |                                                                                                                                        |
| FLM0910-25F     | X              | -              | -                       | 44              | 7              | 30                  | 9.5-10.5          | 10           | 6500              | 1.4             | IK                    |                                                                                                                                        |
| FLM1011-3F      | X              | -46            | 24.0                    | 35              | 7.5            | 29                  | 10.7-11.7         | 10           | 825               | 5               | IA                    |                                                                                                                                        |
| FLM1011-4F      | X              | -46            | 25.5                    | 36              | 7              | 29                  | 10.7-11.7         | 10           | 1100              | 5               | IA                    |                                                                                                                                        |
| FLM1011-6F      | X              | -49            | 25.0                    | 37.5            | 7.5            | 28                  | 10.7-11.7         | 10           | 1650              | 4               | IA                    |                                                                                                                                        |
| FLM1011-8F      | X              | -46            | 28.5                    | 39              | 7              | 29                  | 10.7-11.7         | 10           | 2200              | 3               | IB                    |                                                                                                                                        |
| FLM1011-12F     | X              | -45            | 29.5                    | 40.5            | 6              | 25                  | 10.7-11.7         | 10           | 3500              | 2.3             | IB                    |                                                                                                                                        |
| FLM1011-15F     | X              | -45            | 30.0                    | 42              | 7              | 31                  | 10.7-11.7         | 10           | 4000              | 2.3             | IB                    |                                                                                                                                        |
| FLM1011-20F     | X              | -45            | 31.0                    | 43              | 7              | 27                  | 10.7-11.7         | 10           | 6000              | 1.4             | IK                    |                                                                                                                                        |
| FLM1213-4F      | Ku             | -46            | 25.5                    | 36              | 6.5            | 28                  | 12.7-13.2         | 10           | 1100              | 5               | IA                    |                                                                                                                                        |
| FLM1213-6F      | Ku             | -49            | 25.0                    | 37.5            | 7              | 28                  | 12.7-13.2         | 10           | 1650              | 4               | IA                    |                                                                                                                                        |
| FLM1213-8F      | Ku             | -46            | 28.5                    | 39              | 6.5            | 28                  | 12.7-13.2         | 10           | 2200              | 3               | IA                    |                                                                                                                                        |
| FLM1213-12F     | Ku             | -45            | 28.0                    | 40.5            | 5.5            | 24                  | 12.7-13.2         | 10           | 3300              | 2.3             | IB                    |                                                                                                                                        |
| FLM1314-3F      | Ku             | -45            | 24.0                    | 35              | 5.5            | 27                  | 13.75-14.5        | 10           | 825               | 5               | IA                    |                                                                                                                                        |
| FLM1314-6F      | Ku             | -45            | 26.5                    | 37.5            | 5.5            | 22                  | 13.75-14.5        | 10           | 1650              | 4               | IA                    |                                                                                                                                        |
| FLM1314-8F      | Ku             | -45            | 28.0                    | 39              | 6              | 27                  | 13.75-14.5        | 10           | 2400              | 2.8             | IA                    |                                                                                                                                        |
| ELM1314-9F      | Ku             | -30            | 33.0                    | 39.5            | 6.0            | 30                  | 13.75-14.5        | 10           | 2400              | 3.5             | IA                    |                                                                                                                                        |
| FLM1314-12F     | Ku             | -45            | 29.0                    | 41.0            | 6              | 23                  | 13.75-14.5        | 10           | 4200              | 1.8             | IB                    |                                                                                                                                        |
| FLM1314-18F     | Ku             | -30            | 36.0                    | 42.5            | 6              | 27                  | 13.75-14.5        | 10           | 5000              | 1.8             | IB                    |                                                                                                                                        |
| ELM1314-30F/001 | Ku             | -30            | 38.0                    | 44.5            | 5.5            | 22                  | 13.75-14.5        | 10           | 9000              | 1               | M2A                   |                                                                                                                                        |
| FLM1414-3F      | Ku             | -46            | 24.0                    | 35              | 6.5            | 27                  | 14.0-14.5         | 10           | 825               | 5               | IA                    |                                                                                                                                        |
| FLM1414-4F      | Ku             | -46            | 25.5                    | 36              | 6              | 27                  | 14.0-14.5         | 10           | 1100              | 5               | IA                    |                                                                                                                                        |
| FLM1414-6F      | Ku             | -46            | 26.5                    | 37.5            | 6.5            | 24                  | 14.0-14.5         | 10           | 1650              | 4               | IA                    |                                                                                                                                        |
| FLM1414-8F      | Ku             | -46            | 28.5                    | 39              | 6              | 27                  | 14.0-14.5         | 10           | 2200              | 3.0             | IA                    |                                                                                                                                        |
| FLM1414-12F     | Ku             | -              | -                       | 41              | 6              | 23                  | 14.0-14.5         | 10           | 4200              | 1.8             | IB                    |                                                                                                                                        |
| FLM1414-15F     | Ku             | -45            | 30.0                    | 42              | 6              | 26                  | 14.0-14.5         | 10           | 4200              | 1.8             | IB                    |                                                                                                                                        |
| ELM1414-30F/001 | Ku             | -30            | 38.0                    | 44.5            | 6              | 22                  | 14.0-14.5         | 10           | 9000              | 1               | M2A                   |                                                                                                                                        |
| FLM1415-3F      | Ku             | -45            | 23.5                    | 34.5            | 5.5            | 23                  | 14.5-15.3         | 10           | 825               | 5               | IA                    |                                                                                                                                        |
| FLM1415-4F      | Ku             | -              | -                       | 36              | 5.5            | 26                  | 14.5-15.3         | 10           | 1100              | 5               | IA                    |                                                                                                                                        |
| FLM1415-6F      | Ku             | -45            | 26.0                    | 37              | 5.5            | 20                  | 14.5-15.3         | 10           | 1650              | 4               | IA                    |                                                                                                                                        |
| FLM1415-8F      | Ku             | -              | -                       | 39              | 5              | 25                  | 14.5-15.3         | 10           | 2200              | 3               | IA                    |                                                                                                                                        |

# High Power GaAs FETs

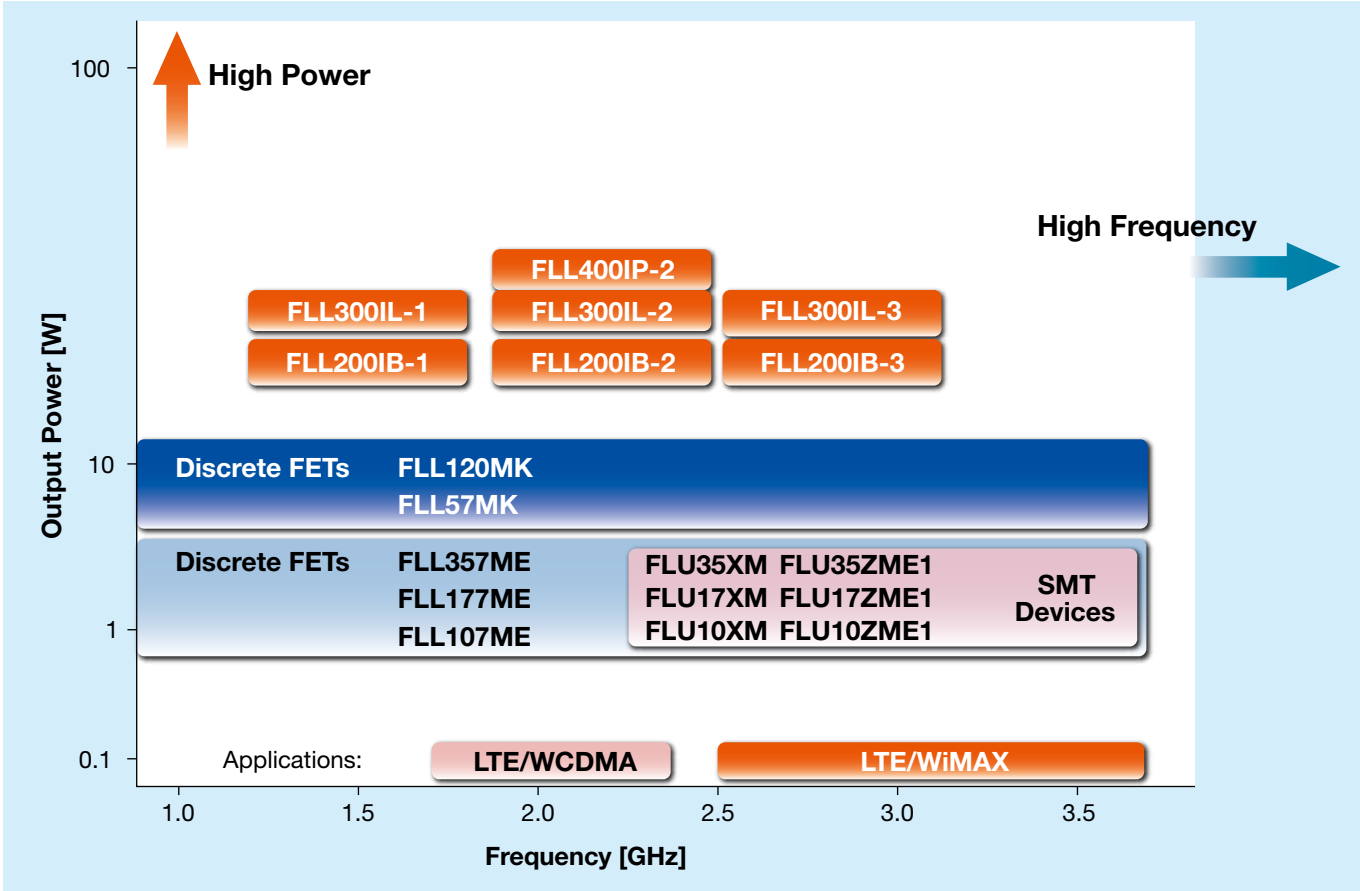
Sumitomo Electric has developed 40W - 80W high power Push-Pull GaAs FETs for Mobile Base Station applications such as Cellular, WCDMA, LTE and WiMAX. Additionally, plastic packaged devices are under development for cost driven systems.

Features

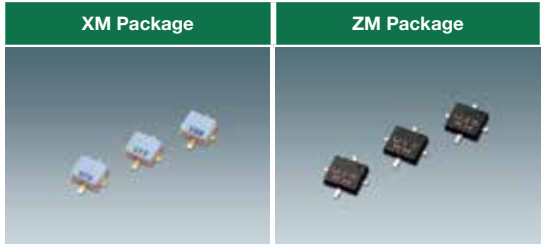
- High Output Power: Up to 40W
- High Gain
- Operating Voltage: 10V, 12V
- Proven Reliability



◆L-Band, S-Band High Output GaAs FET Lineup



Product Photo



# High Power GaAs FETs

Specifications

| Part Number | Frequency Band | Series | P1dB Typ. (dBm) | G1dB Typ. (dB) | $\eta_{add}$ Typ. (%) | Frequency (GHz) | VDS Typ. (V) | IDS(DC) Typ. (mA) | Rth Typ. (°C/W) | Outline/Package Code | Feature    |
|-------------|----------------|--------|-----------------|----------------|-----------------------|-----------------|--------------|-------------------|-----------------|----------------------|------------|
| FLU10XM     | L              | FLU    | 29.5            | 14.5           | 47                    | 2               | 10           | 180               | 25              | XM                   | SMT-Device |
| FLU10ZME1   | L              | FLU    | 29.5            | 13             | 46                    | 2               | 10           | 180               | 15              | ZM                   |            |
| FLU17XM     | L              | FLU    | 32.5            | 12.5           | 46                    | 2               | 10           | 360               | 15              | XM                   |            |
| FLU17ZME1   | L              | FLU    | 32.5            | 12.5           | 45                    | 2               | 10           | 360               | 12              | ZM                   |            |
| FLU35XM     | L              | FLU    | 35.5            | 12.5           | 46                    | 2               | 10           | 720               | 7.5             | XM                   |            |
| FLU35ZME1   | L              | FLU    | 35.5            | 11.5           | 45                    | 2               | 10           | 720               | 5               | ZM                   |            |
| FLL107ME    | L              | FLL    | 29.5            | 13.5           | 47                    | 2.3             | 10           | 180               | 25              | ME                   | Single-end |
| FLL177ME    | L              | FLL    | 32.5            | 12.5           | 46                    | 2.3             | 10           | 360               | 15              | ME                   |            |
| FLL357ME    | L              | FLL    | 35.5            | 11.5           | 46                    | 2.3             | 10           | 720               | 7.5             | ME                   |            |
| FLL57MK     | L              | FLL    | 36              | 11.5           | 37                    | 2.3             | 10           | 990               | 6.2             | MK                   |            |
| FLL120MK    | L              | FLL    | 40              | 10.0           | 40                    | 2.3             | 10           | 2200              | 3.3             | MK                   |            |
| FLL200IB-1  | L              | FLL    | 42.5            | 13.0           | 35                    | 1.5             | 10           | 4800              | 1.6             | IB                   |            |
| FLL200IB-2  | L              | FLL    | 42.5            | 11.0           | 34                    | 2.3             | 10           | 4800              | 1.6             | IB                   |            |
| FLL200IB-3  | L              | FLL    | 42.5            | 11.0           | 34                    | 2.6             | 10           | 4800              | 1.6             | IB                   |            |
| FLL300IL-1  | L              | FLL    | 44.5            | 13.0           | 45                    | 0.9             | 10           | 6000              | 1               | IL                   |            |
| FLL300IL-2  | L              | FLL    | 44.5            | 12.0           | 44                    | 1.8             | 10           | 6000              | 1               | IL                   |            |
| FLL300IL-3  | L              | FLL    | 44.5            | 10.0           | 42                    | 2.6             | 10           | 6000              | 1               | IL                   | Push-Pull  |
| FLL400IP-2  | L              | FLL    | 45.5            | 10.0           | 44                    | 1.96            | 12           | 2000              | 1               | IP                   |            |

| Part Number   | Frequency Band | Series | P1dB Typ. (dBm) | G1dB Typ. (dB) | $\eta_{add}$ Typ. (%) | Frequency (GHz) | VDS Typ. (V) | IDS(DC) Typ. (mA) | Rth Typ. (°C/W) | Outline/Package Code | Feature     |
|---------------|----------------|--------|-----------------|----------------|-----------------------|-----------------|--------------|-------------------|-----------------|----------------------|-------------|
| FLC097WF      | C              | FLC    | 28.8            | 8.5            | 35                    | 6               | 10           | 180               | 25              | WF                   | General-use |
| FLC167WF      | C              | FLC    | 31.8            | 7.5            | 35                    | 6               | 10           | 360               | 15              | WF                   |             |
| FLC257MH-6*   | C              | FLC    | 34              | 9              | 36                    | 6.4             | 10           | 600               | 8               | MH                   |             |
| FLC057WG      | C              | FLC    | 27              | 9              | 38                    | 8               | 10           | 120               | 27              | WG                   |             |
| FLC107WG      | C              | FLC    | 30              | 8              | 36                    | 8               | 10           | 240               | 16              | WG                   |             |
| FLC257MH-8*   | C              | FLC    | 34              | 8              | 35                    | 8.5             | 10           | 600               | 8               | MH                   |             |
| FLX107MH-12*1 | X              | FLX    | 30              | 7.5            | 33                    | 12.5            | 10           | 240               | 15              | MH                   |             |
| FLX207MH-12*  | X              | FLX    | 32.5            | 7              | 28                    | 12.5            | 10           | 480               | 10              | MH                   |             |
| FLK017WF      | Ku             | FLK    | 20.5            | 7.5            | 26                    | 14.5            | 10           | 36                | 65              | WF                   |             |
| FLK027WG      | Ku             | FLK    | 24              | 7              | 32                    | 14.5            | 10           | 60                | 40              | WG                   |             |
| FLK057WG      | Ku             | FLK    | 27              | 7              | 32                    | 14.5            | 10           | 120               | 20              | WG                   |             |
| FLK107MH-14*  | Ku             | FLK    | 30              | 6.5            | 31                    | 14.5            | 10           | 240               | 15              | MH                   |             |

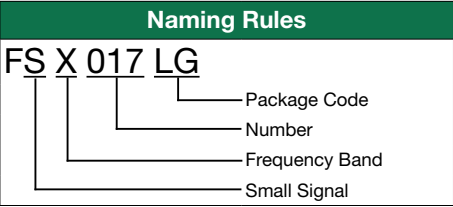
\*: Partially Input/Output Matched

# Small Signal GaAs FETs

FSU/FSX series are GaAs FETs that are designed for medium output power amplifier and oscillator applications with a wide dynamic range up to X-band frequencies. Tape and reel is available for both LP/LG packages.

### Features

- Medium Power: P1dB = 15 to 24.5dBm
- High Gain: G1dB = 8 to 19dB
- High Reliability
- Hermetic Metal/Ceramic Packages (WF/LG)

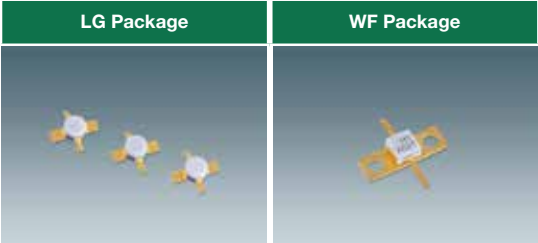


### Specifications

| Part Number | P1dB<br>Typ.<br>(dBm) | G1dB<br>Typ.<br>(dB) | Measurement Conditions 1 |                                |                                 | Noise<br>figure<br>NF<br>Typ.<br>(dB) | Associated<br>gain<br>Gas<br>Typ.<br>(dB) | Measurement Conditions 2 |                                |                                 | Outline/<br>Package<br>Code | Feature/<br>Application |
|-------------|-----------------------|----------------------|--------------------------|--------------------------------|---------------------------------|---------------------------------------|-------------------------------------------|--------------------------|--------------------------------|---------------------------------|-----------------------------|-------------------------|
|             |                       |                      | Frequency<br>f<br>(GHz)  | Drain<br>Voltage<br>VDS<br>(V) | Drain<br>Current<br>IDS<br>(mA) |                                       |                                           | Frequency<br>f<br>(GHz)  | Drain<br>Voltage<br>VDS<br>(V) | Drain<br>Current<br>IDS<br>(mA) |                             |                         |
| FSU01LG     | 20                    | 19                   | 2                        | 6                              | 40                              | 0.5                                   | 18.5                                      | 2                        | 3                              | 10                              | LG *                        | Medium Power            |
| FSU02LG     | 23                    | 17                   | 2                        | 6                              | 80                              | 1.5                                   | 17.5                                      | 2                        | 3                              | 20                              | LG *                        |                         |
| FSX027WF    | 24.5                  | 10                   | 8                        | 8                              | 77                              | 2.5                                   | 9.5                                       | 8                        | 3                              | 30                              | WF                          |                         |
| FSX017WF    | 21.5                  | 11                   | 8                        | 8                              | 39                              | 2.5                                   | 10.5                                      | 8                        | 3                              | 10                              | WF                          |                         |
| FSX017LG    | 16                    | 8                    | 12                       | 4                              | 30                              | -                                     | -                                         | -                        | -                              | -                               | LG *                        |                         |

\*: FSU01LG, FSU02LG, FSX017LG are all in LG-pkg with short lead.  
Note: Tc (op) = +25°C

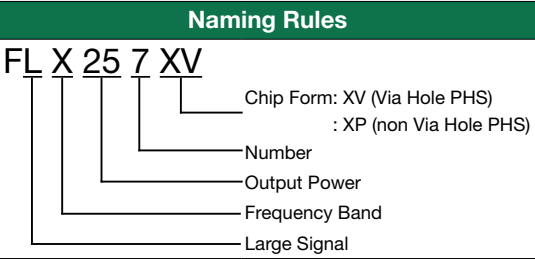
### Product Photo



# GaAs FETs (Chip)

### Features

- High Gain, High Frequency Chip



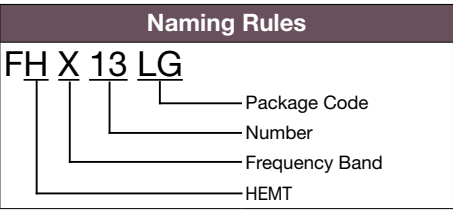
### Specifications

| Part Number | 1dB<br>Compression<br>Power P1dB<br>(dBm) | 1dB<br>Compression<br>Gain G1dB<br>(dB) | Power Added<br>Efficiency<br>ηadd<br>(%) | Frequency<br>f<br>(GHz) | Drain Voltage<br>VDS<br>(V) | Drain Current<br>IDS<br>(mA) | Application       |
|-------------|-------------------------------------------|-----------------------------------------|------------------------------------------|-------------------------|-----------------------------|------------------------------|-------------------|
| FSX017X     | 21.5                                      | 11                                      | 42                                       | 8.0                     | 8                           | 38                           | X-band Amplifier  |
| FSX027X     | 24.5                                      | 10                                      | 41                                       | 8.0                     | 8                           | 77                           |                   |
| FLX257XV    | 33.5                                      | 7.5                                     | 31                                       | 10.0                    | 10                          | 600                          | C-band Amplifier  |
| FLC087XP    | 28.5                                      | 7                                       | 31.5                                     | 8.0                     | 10                          | 180                          |                   |
| FLC157XP    | 31.5                                      | 6                                       | 29.5                                     | 8.0                     | 10                          | 360                          | Ku-band Amplifier |
| FLK017XP    | 20.5                                      | 8                                       | 26                                       | 14.5                    | 10                          | 36                           |                   |
| FLK027XP    | 24                                        | 7                                       | 32                                       | 14.5                    | 10                          | 60                           |                   |
| FLK027XV    | 24                                        | 7                                       | 32                                       | 14.5                    | 10                          | 60                           |                   |
| FLK057XV    | 27                                        | 7                                       | 32                                       | 14.5                    | 10                          | 120                          |                   |
| FLK107XV    | 30                                        | 6.5                                     | 31                                       | 14.5                    | 10                          | 240                          |                   |
| FLK207XV    | 32.5                                      | 6                                       | 27                                       | 14.5                    | 10                          | 480                          |                   |

X: Conventional Chip, XP: PHS (Plated Heat Sink), XV: Via Hole PHS

# GaAs HEMTs (High Electron Mobility Transistors)

HEMT series of products was developed by Sumitomo Electric for a wide range of general purpose applications including, but not limited, to DBS converters, Handsets, Base Station, Radio-Telescope and many other applications where low-noise and gain is required. Sumitomo Electric has a full line-up of HEMT products specified for applications in the 4GHz to 12GHz frequency range.



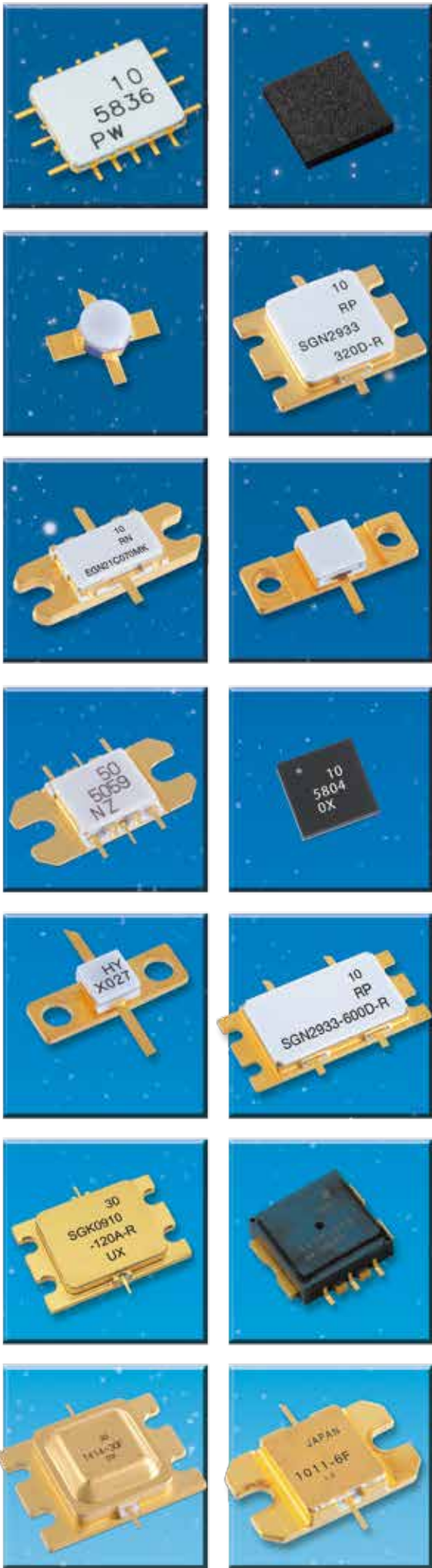
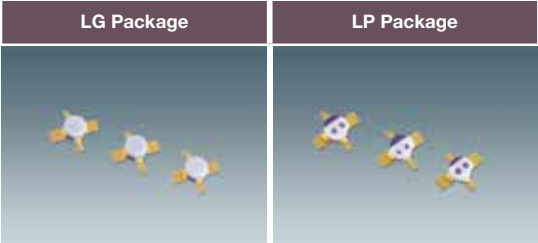
## Specifications

| Part Number | Noise figure<br>NF Typ.<br>(dB) | Associated Gain<br>Gas Typ.<br>(dB) | Drain Voltage<br>VDS<br>(V) | Drain Current<br>IDS<br>(mA) | Frequency<br>f<br>(GHz) | Outline/<br>Package Code | Application                  |
|-------------|---------------------------------|-------------------------------------|-----------------------------|------------------------------|-------------------------|--------------------------|------------------------------|
| FHC40LG     | 0.3                             | 15.5                                | 2                           | 10                           | 4                       | LG                       | Low Noise Amp, TVRO,<br>BTS  |
| FHC30LG     | 0.35                            | 14.5                                | 2                           | 10                           | 4                       | LG                       |                              |
| FHX76LP     | 0.4                             | 13.5                                | 2                           | 10                           | 12                      | LP                       | Low Noise Amp                |
| FHX13LG     | 0.45                            | 13.0                                | 2                           | 10                           | 12                      | LG                       |                              |
| FHX14LG     | 0.55                            | 13.0                                | 2                           | 10                           | 12                      | LG                       |                              |
| FHX04LG     | 0.75                            | 10.5                                | 2                           | 10                           | 12                      | LG                       |                              |
| FHX05LG     | 0.9                             | 10.5                                | 2                           | 10                           | 12                      | LG                       |                              |
| FHX06LG     | 1.1                             | 10.5                                | 2                           | 10                           | 12                      | LG                       |                              |
| FHX35LG     | 1.2                             | 10.0                                | 3                           | 10                           | 12                      | LG                       | Low Noise Amp, Mixer,<br>GPS |
| FHX35LP     | 1.2                             | 10.0                                | 3                           | 10                           | 12                      | LP                       |                              |

| Part Number | Noise figure<br>NF Typ.<br>(dB) | Associated Gain<br>Gas Typ.<br>(dB) | Drain Voltage<br>VDS<br>(V) | Drain Current<br>IDS<br>(mA) | Frequency<br>f<br>(GHz) | Application   |
|-------------|---------------------------------|-------------------------------------|-----------------------------|------------------------------|-------------------------|---------------|
| FHX13X      | 0.45                            | 13                                  | 2                           | 10                           | 12                      | Low Noise Amp |
| FHX14X      | 0.55                            | 13                                  | 2                           | 10                           | 12                      |               |
| FHX04X      | 0.75                            | 10.5                                | 2                           | 10                           | 12                      |               |
| FHX05X      | 0.9                             | 10.5                                | 2                           | 10                           | 12                      |               |
| FHX06X      | 1.1                             | 10.5                                | 2                           | 10                           | 12                      |               |
| FHX45X      | 0.55                            | 12                                  | 2                           | 10                           | 12                      |               |
| FHX35X      | 1.2                             | 10                                  | 2                           | 10                           | 12                      |               |

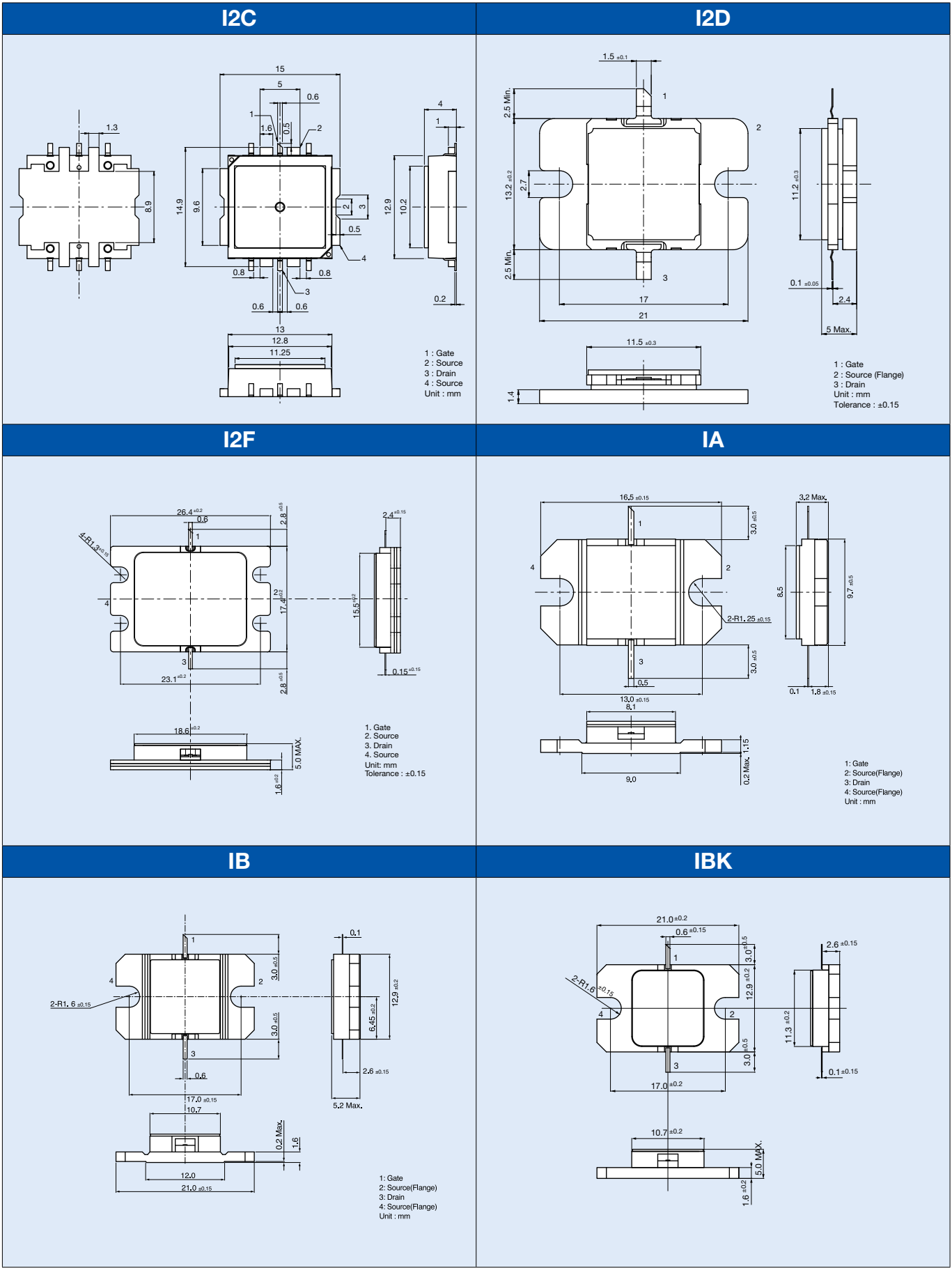
X: Conventional Chip

## Product Photo

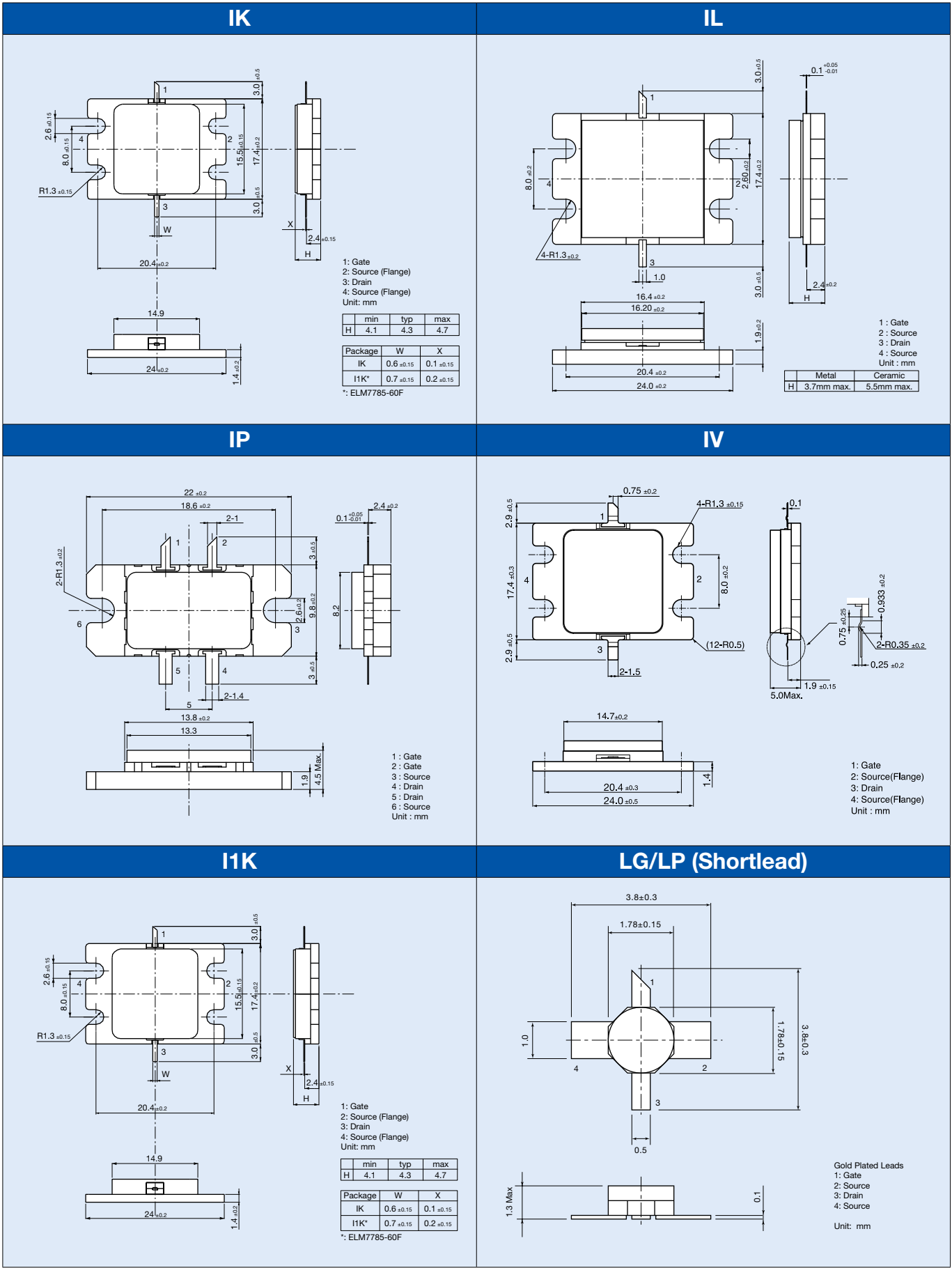


# Packages

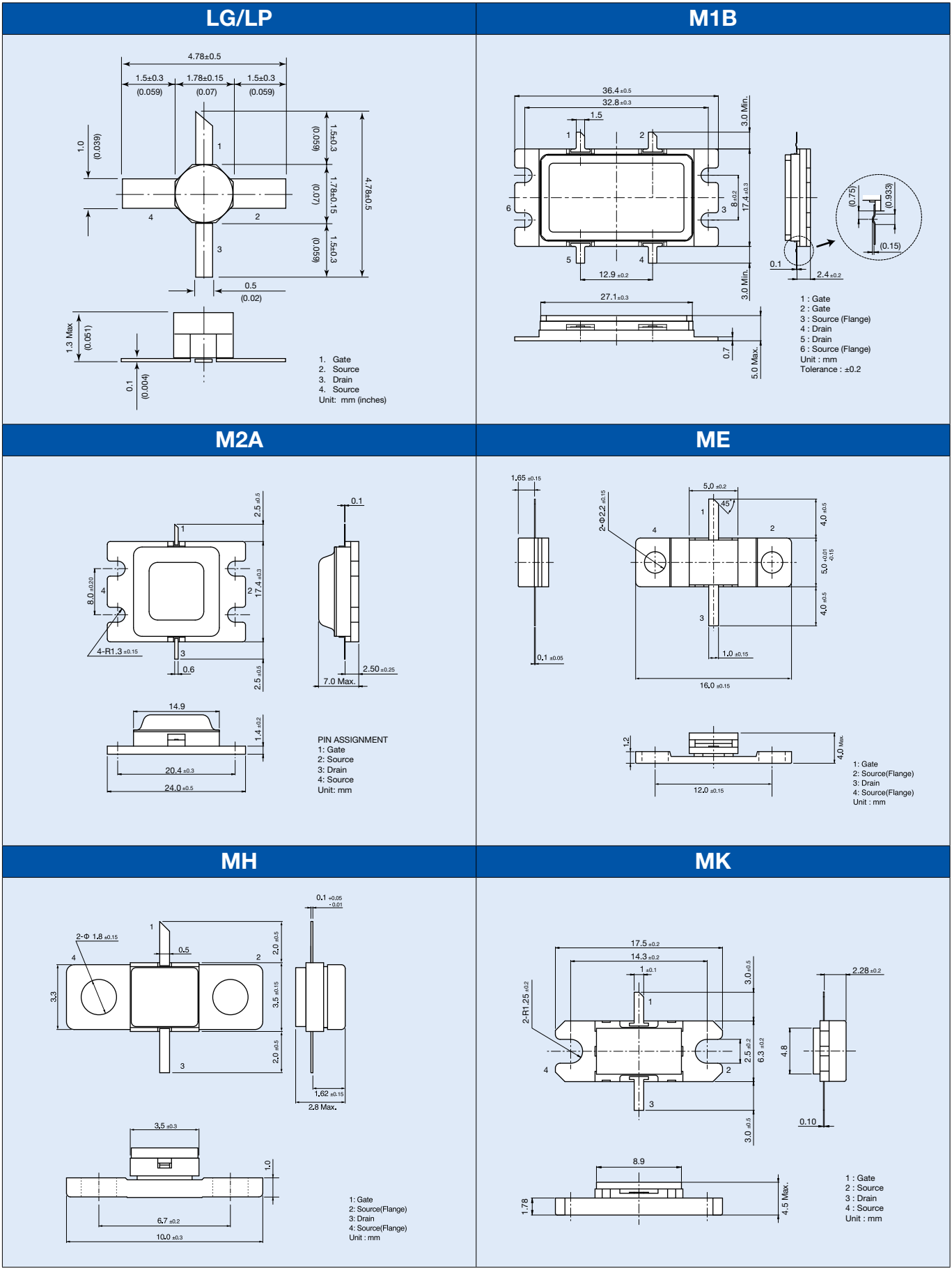
Packages



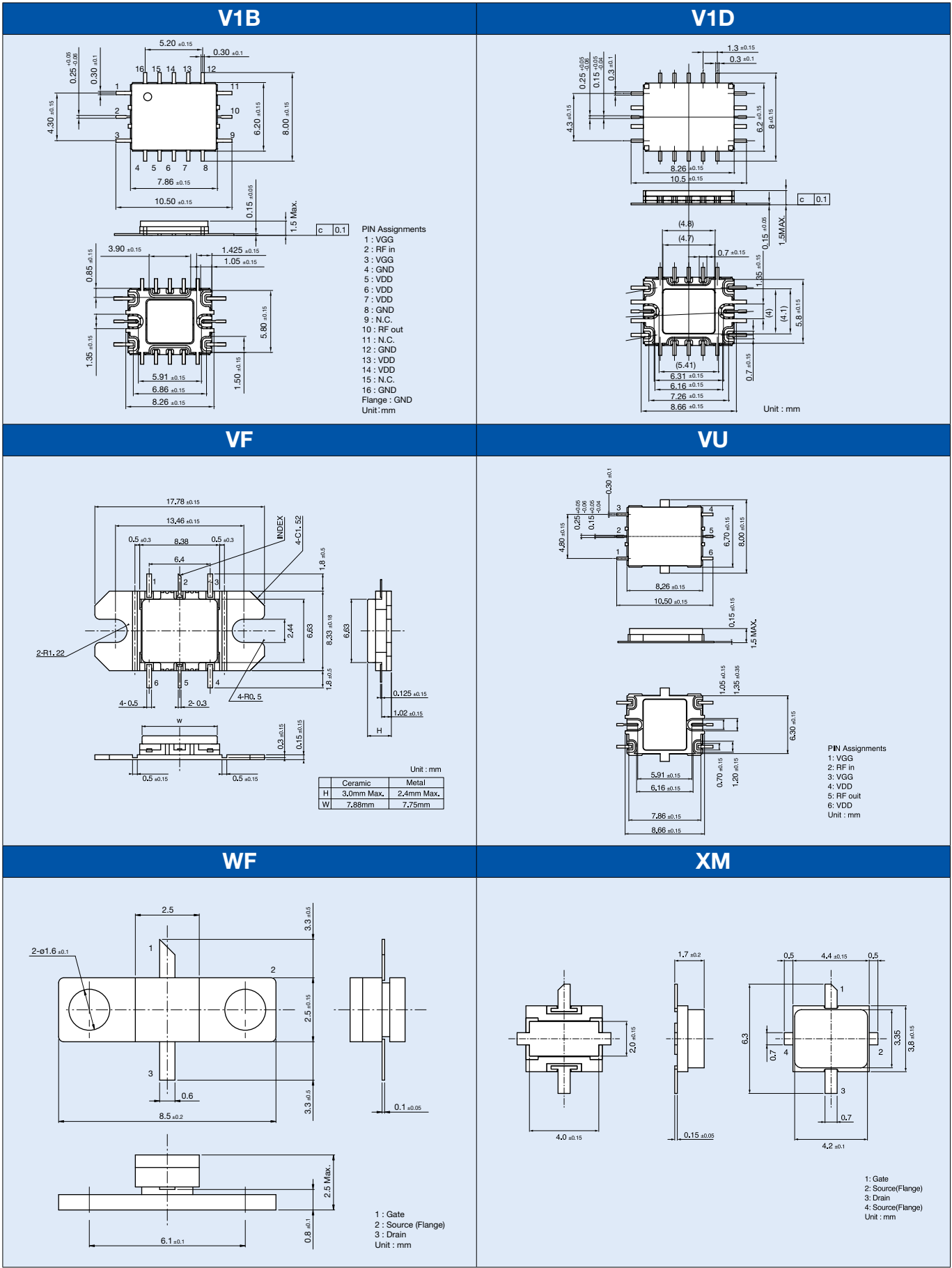
Packages



# Packages



# Packages



# Packages



## Sealing Rules

Note: Code letter is cycling 25 alphabet without Q.

Diagram illustrating the component identification markings on the 320D-R component. The markings are as follows:

- 10
- RP
- SGN2933
- 320D-R

Legend:

- Month
- Year

# Memo

# Creating Value for Customers

## Corporate Quality Assurance

Sumitomo Electric strives to achieve the highest quality and reliability performance on all the products it supplies. This is accomplished through a systemic approach that emphasizes quality at every stage of product development through the manufacturing process. Quality is built into the product from design to wafer fabrication, test, and assembly. Sumitomo Electric has a Quality Management System that is certified to ISO9000 (ISO9001: 2008) and Aerospace Quality Management System JIS Q 9100. This system assures customers the highest quality product with long term reliability required for their applications.

## Quality Management

### ◆ ISO9001 Record

|           |                                                           |
|-----------|-----------------------------------------------------------|
| Sep. 1993 | ISO9002 (Fujitsu Quantum Devices)                         |
| Nov. 1998 | ISO9001                                                   |
| Sep. 2003 | ISO9001: 2000                                             |
| Apr. 2004 | Eudyna Device Inc.                                        |
| Oct. 2004 | Expansion to Yokohama Factory                             |
| Oct. 2005 | Expansion to Eudyna Microwave Assembly                    |
| Sep. 2009 | ISO9001: 2008 (Sumitomo Electric Device Innovation, Inc.) |
| Jul. 2010 | ISO9001: 2000 Revision                                    |



### ◆ JIS Q 9100(AS9100, prEN9100)Record

|           |                                                                      |
|-----------|----------------------------------------------------------------------|
| Aug. 2010 | AS9100 (JIS Q 9100): 2004                                            |
| Jan. 2012 | AS9100 (JIS Q 9100): 2009<br>OASIS Identification Number: 6131093485 |



## Environmental Management

### ◆ ISO14001 Record

|           |                                                            |
|-----------|------------------------------------------------------------|
| Aug. 1998 | ISO14001                                                   |
| Aug. 2004 | Expansion to Eudyna Microwave Assembly (Kofu)              |
| Aug. 2007 | Expansion to Eudyna Microwave Assembly (Matsushiro)        |
| Aug. 2010 | ISO14001: 2004 (Sumitomo Electric Device Innovation, Inc.) |



## For Safety, Observe the Following Procedures Environmental Management

- Do not put this product into the mouth.
- Do not alter the form of this product into a gas, powder, or liquid through burning, crushing, or chemical processing as these by-products are dangerous to the human body if inhaled, ingested, or swallowed.
- Respect all applicable laws of the country when discarding this product.

This product must be disposed in accordance with methods specified by applicable hazardous waste procedures.

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