# BCF060T

## HIGH EFFICIENCY HETEROJUNCTION POWER FET CHIP (.3 µm x 600 µm)

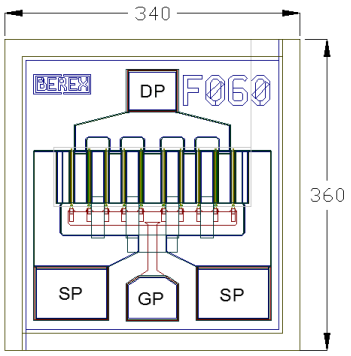
The BeRex BCF060T is a GaAs Power MESFET whose nominal 0.3 micron gate length and 600 micron gate width make the product ideally suited to applications requiring high OIP3 linearity and low phase noise while providing high-gain and medium power from DC to 26.5 GHz. This product is well suited for either wideband or narrow-band applications. The BCF060T is produced using state of the art metallization and devices from each wafer are screened to insure reliability. These chips utilize $SI_3N_4$ passivation for increased reliability.

### Product Features

- 25.0 dBm Typical Output Power
- 12.5 dB Typical Power Gain @ 12 GHz
- Low Phase Noise
- 0.3 X 600 Micron Recessed Gate

### Applications

- Commercial
- Military / Hi-Rel
- Test & Measurement




Chip dimensions : 340 X 360 microns
Gate pad(GP) : 60 X 55 microns
Drain pad(DP) : 60 X 50 microns
Source pad(SP) : 90 X 65 microns
Chip thickness : 100 microns

## DC CHARACTERISTIC ($T_a$ = 25° C)

| PARAMETER/TEST CONDITIONS | | MINIMUM | TYPICAL | MAXIMUM | UNIT |
|---|---|---|---|---|---|
| $I_{dss}$ | Saturated Drain Current ($V_{gs}$ = 0V, $V_{ds}$ = 2V) | 100 | 170 | 240 | mA |
| Gm | Transconductance ($V_{ds}$ = 3V, $V_{gs}$ = 50% $I_{dss}$) | 70 | 100 | | mS |
| Vp | Pinch-off Voltage ($I_{ds}$ = 300 µA, $V_{ds}$ = 3V) | -3.5 | -2.0 | | V |
| $BV_{gd}$ | Drain Breakdown Voltage ($I_g$ = 0.2 mA, source open) | | -15 | -11 | V |
| $BV_{gs}$ | Source Breakdown Voltage ($I_g$ = 0.2 mA, drain open) | | -10 | -7 | V |
| $R_{th}$ | Thermal Resistance (Au-Sn Eutectic Attach) | | 75 | | ° C/W |


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## ELECTRICAL CHARACTERISTIC ($V_{ds}$ = 8V, $T_a$ = 25° C)

| PARAMETER/TEST CONDITIONS | | TEST FREQUENCY | MINIMUM | TYPICAL | MAXIMUM | UNIT |
|---|---|---|---|---|---|---|
| $P_{1dB}$ | Output Power @ $P_{1dB}$ ($V_{ds}$ = 8V, $I_{ds}$ = 50% $I_{dss}$) | 12 GHZ<br>18 GHz | 23.0<br>22.6 | 25.0<br>24.6 | | dBm |
| $G_{1dB}$ | Gain @ $P_{1dB}$ ($V_{ds}$ = 8V, $I_{ds}$ = 50% $I_{dss}$) | 12 GHZ<br>18 GHz | 10.5<br>8.0 | 12.5<br>10.0 | | dB |
| PAE | PAE @ $P_{1dB}$ ($V_{ds}$ = 8V, $I_{ds}$ = 50% $I_{dss}$) | 12 GHZ<br>18 GHz | | 32<br>31 | | % |
| NF | Noise figure ($V_{ds}$ = 2V, $I_{ds}$ = 10 mA) | 12 GHz | | 1.85 | | dB |
| Ga | Associated Gain (($V_{ds}$ = 2V, $I_{ds}$ = 10 mA) | 12 GHz | | 9.5 | | dB |

## ELECTRICAL CHARACTERISTIC ($V_{ds}$ = 6V, $T_a$ = 25° C)

| PARAMETER/TEST CONDITIONS | | TEST FREQUENCY | MINIMUM | TYPICAL | MAXIMUM | UNIT |
|---|---|---|---|---|---|---|
| $P_{1dB}$ | Output Power @ $P_{1dB}$ ($V_{ds}$ = 6V, $I_{ds}$ = 50% $I_{dss}$) | 12 GHZ<br>18 GHz | 22.5<br>22.3 | 24.5<br>24.3 | | dBm |
| $G_{1dB}$ | Gain @ $P_{1dB}$ ($V_{ds}$ = 6V, $I_{ds}$ = 50% $I_{dss}$) | 12 GHZ<br>18 GHz | 10.2<br>7.8 | 12.2<br>9.8 | | dB |
| PAE | PAE @ $P_{1dB}$ ($V_{ds}$ = 6V, $I_{ds}$ = 50% $I_{dss}$) | 12 GHZ<br>18 GHz | | 37<br>39 | | % |
| NF | Noise figure ($V_{ds}$ = 2V, $I_{ds}$ = 10 mA) | 12 GHz | | 1.85 | | dB |
| Ga | Associated Gain (($V_{ds}$ = 2V, $I_{ds}$ = 10 mA) | 12 GHz | | 9.5 | | dB |

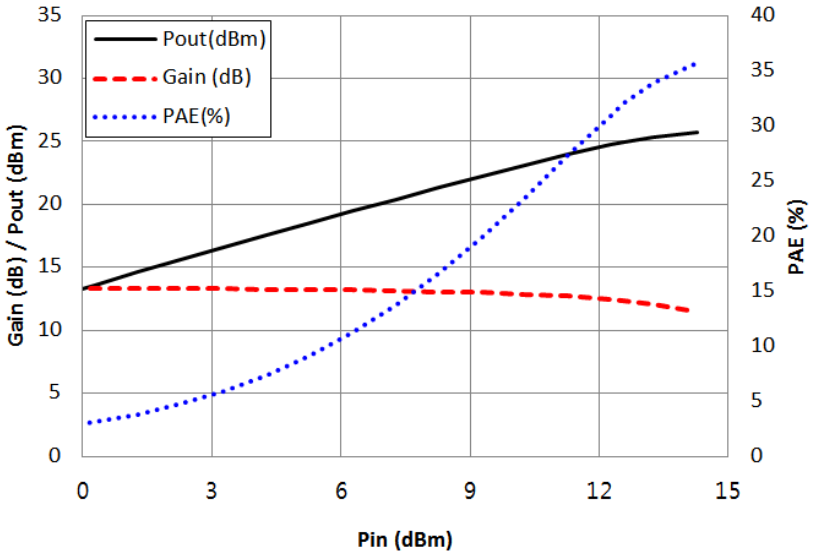
## MAXIMUM RATINGS ($T_a$ = 25° C)

| PARAMETERS | | ABSOLUTE | CONTINUOUS |
|---|---|---|---|
| $V_{ds}$ | Drain-Source Voltage | 12 V | 8 V |
| $V_{gs}$ | Gate-Source Voltage | -8 V | -4V |
| $I_{ds}$ | Drain Current | $I_{dss}$ | $I_{dss}$ |
| $I_{gsf}$ | Forward Gate Current | 15 mA | 2.4 mA |
| $P_{in}$ | Input Power | 21 dBm | @ 3dB compression |
| $T_{ch}$ | Channel Temperature | 175° C | 150° C |
| $T_{stg}$ | Storage Temperature | -60° C - 150° C | -60° C - 150° C |
| $P_t$ | Total Power Dissipation | 1.9 W | 1.6 W |

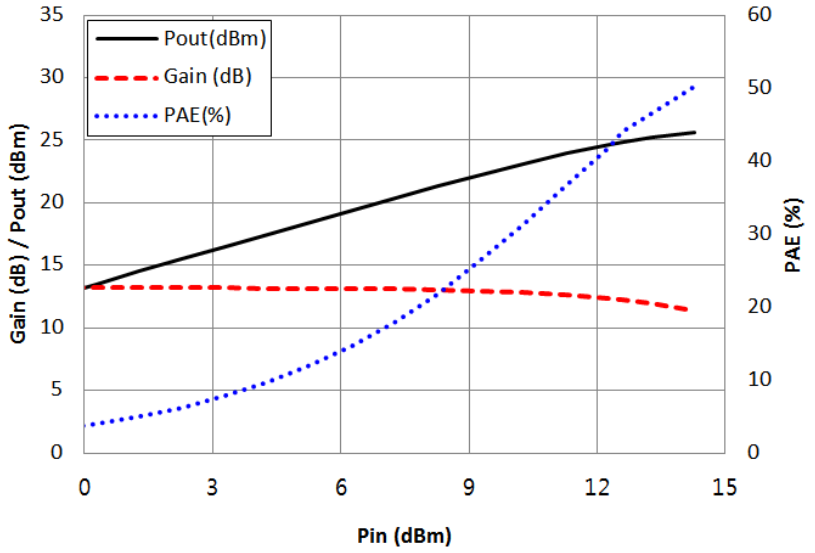
*Exceeding any of the above Maximum Ratings will result in reduced MTTF and may cause permanent damage to the device*


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## $P_{in}$_$P_{out}$/Gain, PAE (12 GHz)

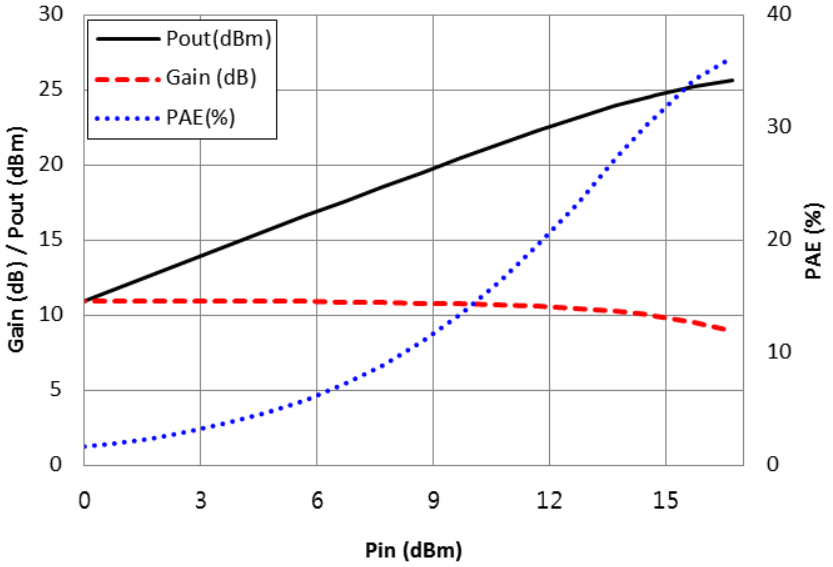



Freq. = 12 GHz, $V_{ds}$ = 8 V, $I_{ds}$ = 50% Idss

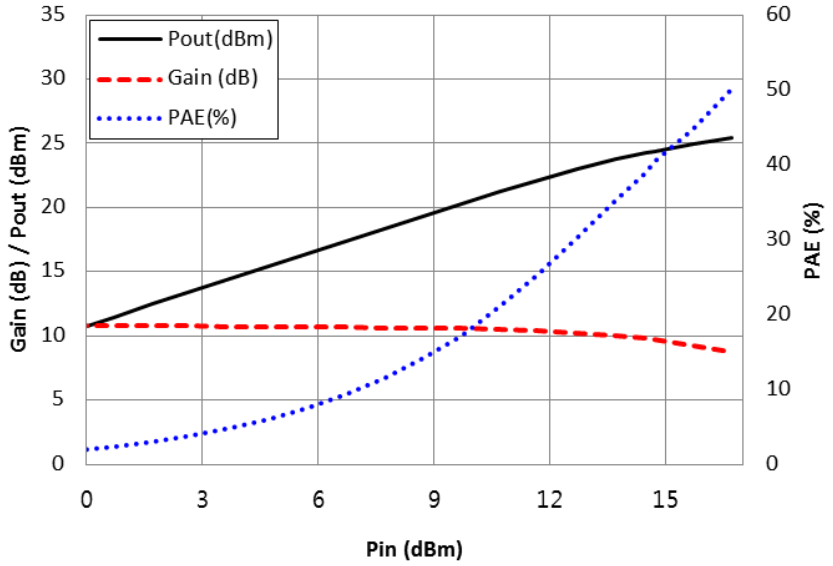



Freq. = 12 GHz, $V_{ds}$ = 6 V, $I_{ds}$ = 50% $I_{dss}$

## $P_{in}$_$P_{out}$/Gain, PAE (18 GHz)



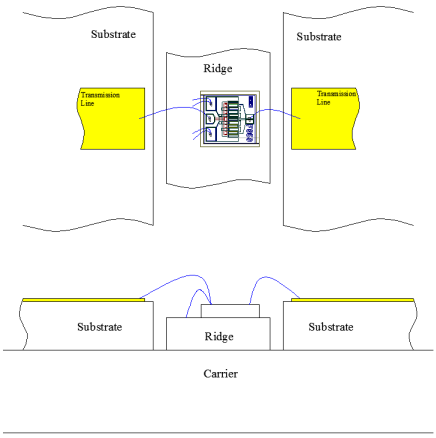

Freq. = 18 GHz, $V_{ds}$ = 8V, $I_{ds}$ = 50% $I_{dss}$




Freq. = 18 GHz, $V_{ds}$ = 6V, $I_{ds}$ = 50% $I_{dss}$


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## Wire Bonding Options




- Gold Bonding Wire information

1. Gate to input transmission line
   - Length and Height : 400 um and 250 um
   - Number of wires: 1
2. Drain to output transmission line
   - Length and Height : 350 um and 250 um
   - Number of wires: 1
3. Source to ground plate
   - Length and Height : 200 um x 250 um
   - Number of wires: 4

Note: The diameter of bonding wires: 1 mil

**Caution: ESD Sensitive**
Appropriate precautions in handling, packaging and testing devices must be observed.

Proper ESD procedures should be followed when handling this device.


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**DIE ATTACH RECOMMENDATIONS:**

BeRex recommends the "Eutectic" die attach using Au-Sn (80%-20%) pre-forms. The die attach station must have accurate temperature control, and the operation should be performed with parts no hotter than 300°C for less than 60 seconds. An inert forming gas (90% $N_2$-10% $H_2$) or clean, dry $N_2$ should be used.

**HANDLING PRECAUTIONS:**

GaAs FETs are very sensitive to and may be damaged by Electrostatic Discharge (ESD). Therefore, proper ESD precautions must be taken whenever you are handling these devices. It is critically important that all work surfaces, and assembly equipment, as well as the operator be properly grounded when handling these devices to prevent ESD damage.

**STORAGE & SHIPPING:**

BeRex's standard chip device shipping package consists of an antistatic "Gel-Pak", holding the chips, placed inside a sealed antistatic and moisture barrier bag. This packaging is designed to provide a reasonable measure of protection from both mechanical and ESD damage.

Chip devices should be stored in a clean, dry Nitrogen gas environment at room temperature until they are required for assembly. Only open the shipping package or perform die assembly in a work area with a class 10,000 or better clean room environment to prevent contamination of the exposed devices.

**CAUTION:**

THIS PRODUCT CONTAINS GALLIUM ARSENIDE (GaAs) WHICH CAN BE HAZARDOUS TO THE HUMAN BODY AND THE ENVIRONMENT. THEREFORE, IT MUST BE HANDLED WITH CARE AND IN ACCORDANCE WITH ALL GOVERNMENTAL AND COMPANY REGULATIONS FOR THE SAFE HANDLING AND DISPOSAL OF HAZARDOUS WASTE. DO NOT BURN, DESTROY, CUT, CRUSH OR CHEMICALLY DISSOLVE THE PRODUCT. DO NOT LICK THE PRODUCT OR IN ANY WAY ALLOW IT TO ENTER THE MOUTH. EXCLUDE THE PRODUCT FROM GENERAL INDUSTRIAL WASTE OR GARBAGE AND DISPOSE OF ONLY IN ACCORDANCE TO APPLICABLE LAWS AND/OR ORDINANCES.

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Üretici parça numarasını yazın; stok ve fiyatı hemen görün.

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