

## RF & MICROWAVE TRANSISTORS S-BAND RADAR APPLICATIONS

PRELIMINARY DATA

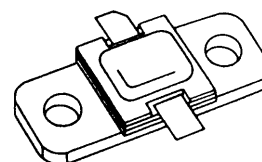
- REFRACTORY/GOLD METALLIZATION
- EMITTER SITE BALLASTED
- LOW THERMAL RESISTANCE
- INPUT/OUTPUT MATCHING
- OVERLAY GEOMETRY
- METAL/CERAMIC HERMETIC PACKAGE
- $P_{OUT} = 15 \text{ W MIN. WITH } 5.2 \text{ dB GAIN}$

### DESCRIPTION

The AM83135-015 device is a high power silicon bipolar NPN transistor specifically designed for S-Band radar pulsed output and driver applications.

This device is characterized at 100μsec pulse width and 10% duty cycle, but is capable of operation over a range of pulse widths, duty cycles, and temperatures, and can withstand a 3:1 output VSWR with a + 1 dB input overdrive. Low RF thermal resistance, refractory/gold metallization, and computerized automatic wire bonding techniques ensure high reliability and product consistency (including phase characteristics).

The AM83135-015 is supplied in the IMPAC™ Hermetic Metal/Ceramic package with internal Input/Output impedance matching circuitry, and is intended for military and other high reliability applications.



**.310 x .310 2LFL (S064)**

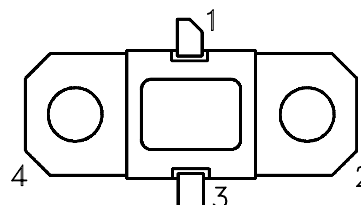
#### ORDER CODE

AM83131-015

#### BRANDING

83135-15

### PIN CONNECTION



1. Collector

2. Base

3. Emitter

4. Base

### ABSOLUTE MAXIMUM RATINGS ( $T_{case} = 25^{\circ}\text{C}$ )

| Symbol     | Parameter  | Value        | Unit               |
|------------|--|--------------|--------------------|
| $P_{DISS}$ | Power Dissipation* ( $T_C \leq 50^{\circ}\text{C}$ ) | 71           | W                  |
| $I_C$      | Device Current*                                      | 3.0          | A                  |
| $V_{CC}$   | Collector-Supply Voltage*                            | 46           | V                  |
| $T_J$      | Junction Temperature (Pulsed RF Operation)           | 250          | $^{\circ}\text{C}$ |
| $T_{STG}$  | Storage Temperature                                  | - 65 to +200 | $^{\circ}\text{C}$ |

### THERMAL DATA

|               |                                   |     |                      |
|---------------|-----------------------------------|-----|----------------------|
| $R_{TH(j-c)}$ | Junction-Case Thermal Resistance* | 2.8 | $^{\circ}\text{C/W}$ |
|---------------|-----------------------------------|-----|----------------------|

\*Applies only to rated RF amplifier operation

**ELECTRICAL SPECIFICATIONS** ( $T_{\text{case}} = 25^{\circ}\text{C}$ )**STATIC**

| Symbol            | Test Conditions                |                                | Value |      |      | Unit |
|-------------------|--------------------------------|--------------------------------|-------|------|------|------|
|                   |                                |                                | Min.  | Typ. | Max. |      |
| $BV_{\text{CBO}}$ | $I_{\text{C}} = 10 \text{ mA}$ | $I_{\text{E}} = 0 \text{ mA}$  | 55    | —    | —    | V    |
| $BV_{\text{EBO}}$ | $I_{\text{E}} = 2 \text{ mA}$  | $I_{\text{C}} = 0 \text{ mA}$  | 3.5   | —    | —    | V    |
| $BV_{\text{CER}}$ | $I_{\text{C}} = 10 \text{ mA}$ | $R_{\text{BE}} = 10 \Omega$    | 55    | —    | —    | V    |
| $I_{\text{CES}}$  | $V_{\text{BE}} = 0 \text{ V}$  | $V_{\text{CE}} = 40 \text{ V}$ | —     | —    | 8    | mA   |
| $h_{\text{FE}}$   | $V_{\text{CE}} = 5 \text{ V}$  | $I_{\text{C}} = 1 \text{ A}$   | 30    | —    | 300  | —    |

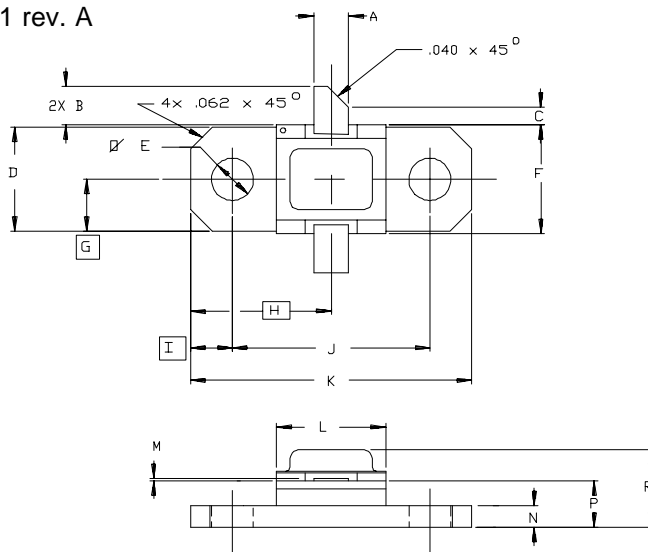
**DYNAMIC**

| Symbol            | Test Conditions             |                                 |                                | Value |      |      | Unit |
|-------------------|-----------------------------|---------------------------------|--------------------------------|-------|------|------|------|
|                   |                             |                                 |                                | Min.  | Typ. | Max. |      |
| $P_{\text{OUT}}$  | $f = 3.1 - 3.5 \text{ GHz}$ | $P_{\text{IN}} = 4.5 \text{ W}$ | $V_{\text{CC}} = 40 \text{ V}$ | 15    | —    | —    | W    |
| $\eta_{\text{C}}$ | $f = 3.1 - 3.5 \text{ GHz}$ | $P_{\text{OUT}} = 15 \text{ W}$ | $V_{\text{CC}} = 40 \text{ V}$ | 30    | —    | —    | %    |
| $P_{\text{G}}$    | $f = 3.1 - 3.5 \text{ GHz}$ | $P_{\text{OUT}} = 15 \text{ W}$ | $V_{\text{CC}} = 40 \text{ V}$ | 5.2   | —    | —    | dB   |

Note: Pulse Width =  $100\mu\text{s}$   
Duty Cycle = 10%

## PACKAGE MECHANICAL DATA

Ref.: Dwg. No. 12-0221 rev. A



| SGS-THOMSON MICROELECTRONICS |                      |                      | CONT'D               |                      |
|------------------------------|----------------------|----------------------|----------------------|----------------------|
|                              | MINIMUM<br>Inches/mm | MAXIMUM<br>Inches/mm | MINIMUM<br>Inches/mm | MAXIMUM<br>Inches/mm |
| A                            | .095/2,41            | .105/2,67            | K                    | .790/20,07           |
| B                            | .100/2,54            | .120/3,05            | L                    | .300/7,62            |
| C                            | .050/1,27            |                      | M                    | .003/0,08            |
| D                            | .286/7,26            | .306/7,77            | N                    | .052/1,32            |
| E                            | .110/2,79            | .130/3,30            | P                    | .118/3,00            |
| F                            | .306/7,77            | .318/8,08            | R                    | .230/5,84            |
| G                            | .148/3,76            |                      |                      |                      |
| H                            | .400/10,16           |                      |                      |                      |
| I                            | .119/3,02            |                      |                      |                      |
| J                            | .552/14,02           | .572/14,53           |                      |                      |

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