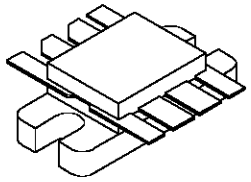
SGS-THOMSON MICROELECTRONICS

# SD1456 (TCC3100)

## RF & MICROWAVE TRANSISTORS TV/LINEAR APPLICATIONS

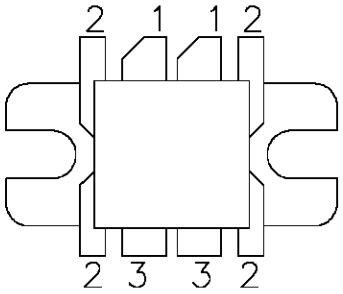
- 170 - 230 MHz
- 28 VOLTS
- CLASS AB PUSH PULL
- DESIGNED FOR HIGH POWER LINEAR OPERATION
- HIGH SATURATED POWER CAPABILITY
- GOLD METALLIZATION
- DIFFUSED EMITTER BALLAST RESISTORS
- COMMON EMITTER CONFIGURATION
- $P_{OUT}$ = 100 W MIN. WITH 11.0 dB GAIN



**.400 x .425 8LFL (M168)**
epoxy sealed

| ORDER CODE | BRANDING |
|---|---|
| SD1456 | TCC3100 |

**PIN CONNECTION**




1. Collector
2. Emitter
3. Base

### DESCRIPTION

The SD1456 is a gold metallized epitaxial silicon NPN planar transistor using diffused emitter ballast resistors for high linearity Class AB operation in VHF and Band III television transmitters and transposers.

### ABSOLUTE MAXIMUM RATINGS ($T_{case}$ = 25°C)

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $V_{CBO}$ | Collector-Base Voltage | 65 | V |
| $V_{CEO}$ | Collector-Emitter Voltage | 33 | V |
| $V_{EBO}$ | Emitter-Base Voltage | 3.5 | V |
| $I_C$ | Device Current | 16 | A |
| $P_{DISS}$ | Power Dissipation | 150 | W |
| $T_J$ | Junction Temperature | +200 | °C |
| $T_{STG}$ | Storage Temperature | – 65 to +150 | °C |

### THERMAL DATA

| | | | |
|---|---|---|---|
| $R_{TH(j-c)}$ | Junction-Case Thermal Resistance | 1.2 | °C/W |

## ELECTRICAL SPECIFICATIONS ($T_{case}$ = 25°C)

STATIC

| Symbol | Test Conditions | | Value | | | Unit |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| $BV_{CBO}$ | $I_C$ = 50mA | $I_E$ = 0mA | 65 | — | — | V |
| $BV_{CER}$ | $I_C$ = 50mA | $R_{BE}$ = 15Ω | 60 | — | — | V |
| $BV_{CEO}$ | $I_C$ = 50mA | $I_B$ = 0mA | 33 | — | — | V |
| $BV_{EBO}$ | $I_E$ = 5mA | $I_C$ = 0mA | 3.5 | — | — | V |
| $h_{FE}$ | $V_{CE}$ = 5V | $I_C$ = 500mA | 20 | — | 150 | — |

DYNAMIC (Class AB)

| Symbol | Test Conditions | | | Value | | | Unit |
|---|---|---|---|---|---|---|---|
| | | | | Min. | Typ. | Max. | |
| $P_{OUT}$ | f = 225 MHz | $V_{CE}$ = 28 V | $I_C$ = 2 x 100 mA | 100 | — | — | W |
| $G_P$ | $P_{OUT}$ = 100 W | $V_{CE}$ = 28 V | $I_C$ = 2 x 100 mA | 11 | — | — | dB |
| $\eta_C$ | $P_{OUT}$ = 100 W | $V_{CE}$ = 28 V | $I_C$ = 2 x 100 mA | 70 | — | — | % |
| $C_{OB}$ | f = 1 MHz | $V_{CB}$ = 28 V | | — | 60 | — | pF |

DYNAMIC (Class A)

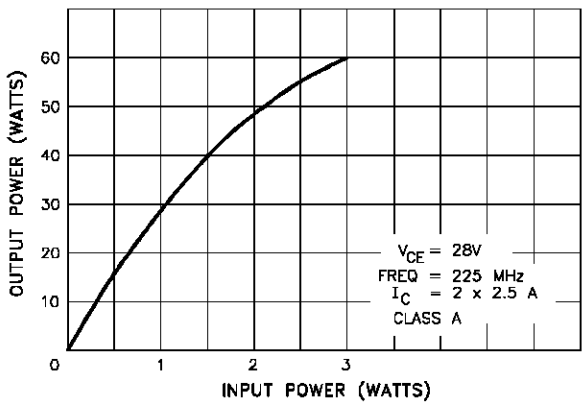
| Symbol | Test Conditions | | | Value | | | Unit |
|---|---|---|---|---|---|---|---|
| | | | | Min. | Typ. | Max. | |
| $P_{OUT}$* | f = 225 MHz | $V_{CE}$ = 28 V | $I_C$ = 2 x 2.5 A | 28 | 32 | — | W |
| $G_P$* | $P_{IN}$ = 1.1 W | $V_{CE}$ = 28 V | $I_C$ = 2 x 2.5 A | 14 | 15 | — | dB |
| $IMD_3$* | $P_{IN}$ = 1.1 W | $V_{CE}$ = 28 V | $P_{REF}$ = 28 W | — | –51 | — | dB |

Note: * Class A Performance Characteristics Indicate Capability but are not Tested.

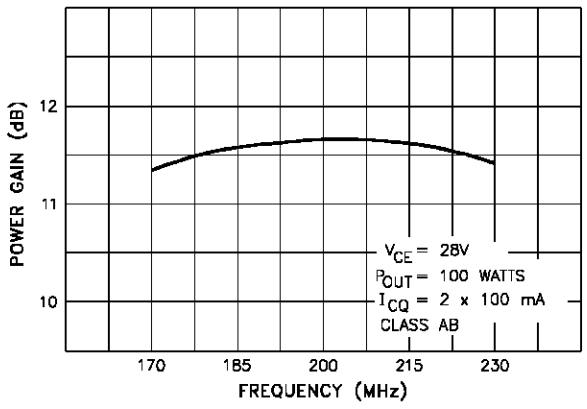
IMD3 - 3 Tone Meaurement; –8, –7, –16dB relative to $P_{REF}$

## TYPICAL PERFORMANCE

**POWER OUTPUT vs POWER INPUT**

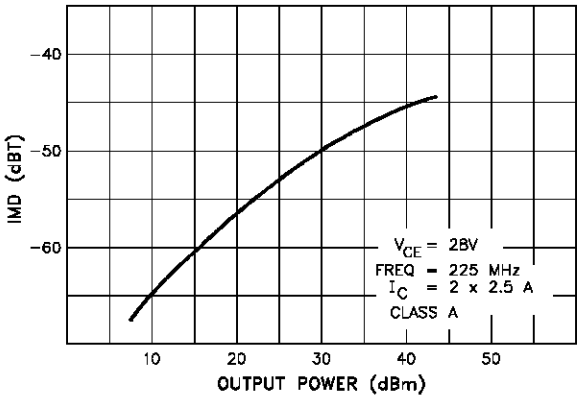



**BROADBAND POWER GAIN vs FREQUENCY**

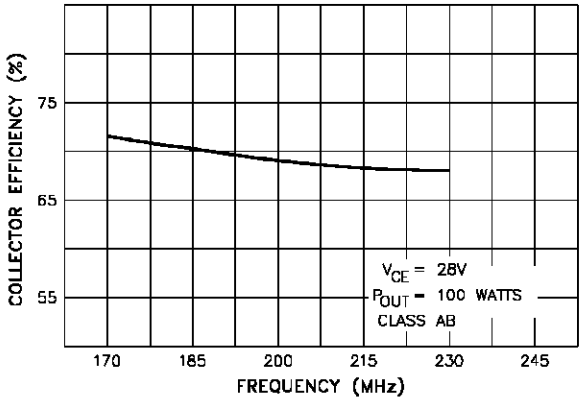


## TYPICAL PERFORMANCE (cont'd)

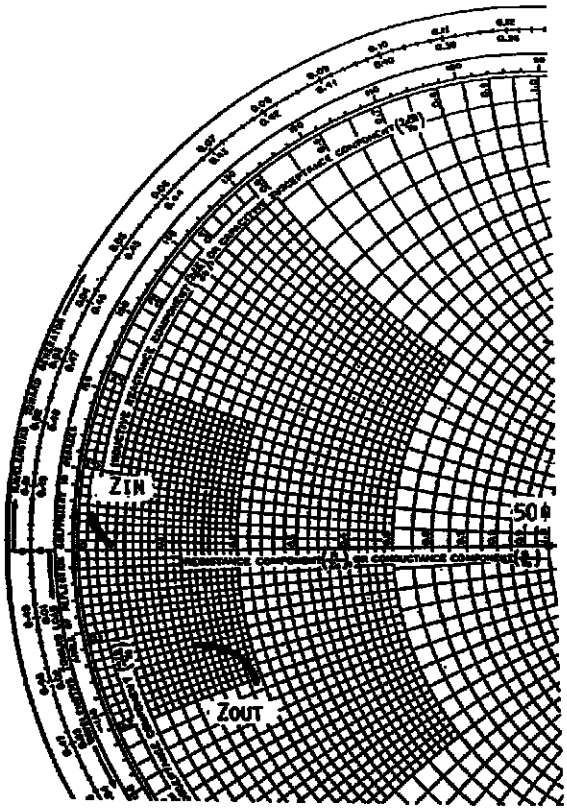
**INTERMODULATION DISTORTION vs POWER OUTPUT**




**COLLECTOR EFFICIENCY vs FREQUENCY**



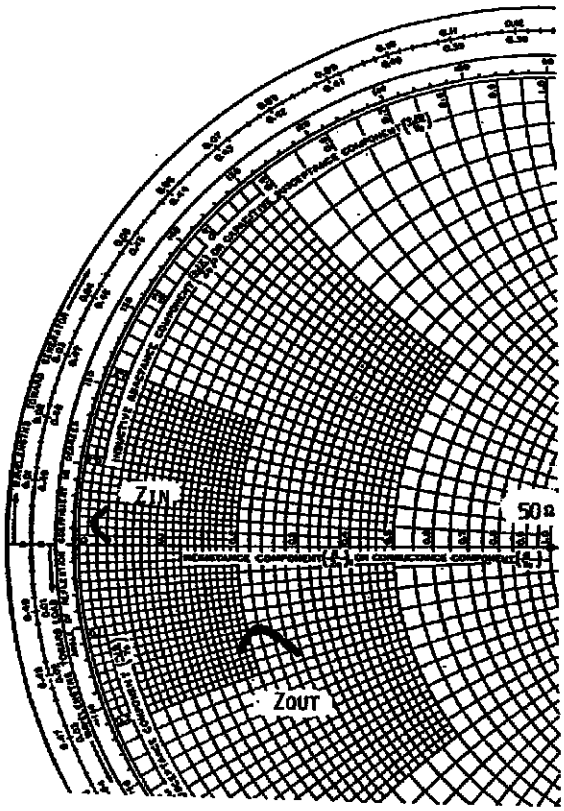

## IMPEDANCE DATA




| FREQ. | $Z_{IN}$ (Ω) | $Z_{OUT}$ (Ω) |
|---|---|---|
| 170 MHz | 1.3 + j 0.6 | 9.5 – j 10.0 |
| 200 MHz | 1.0 + j 1.0 | 9.0 – j 8.0 |
| 230 MHz | 0.9 + j 1.8 | 6.3 – j 6.5 |

$P_{OUT}$ = 100 W
$V_{CE}$ = 28 V
$I_{CQ}$ = 2 x 100 mA
Class AB

## IMPEDANCE DATA

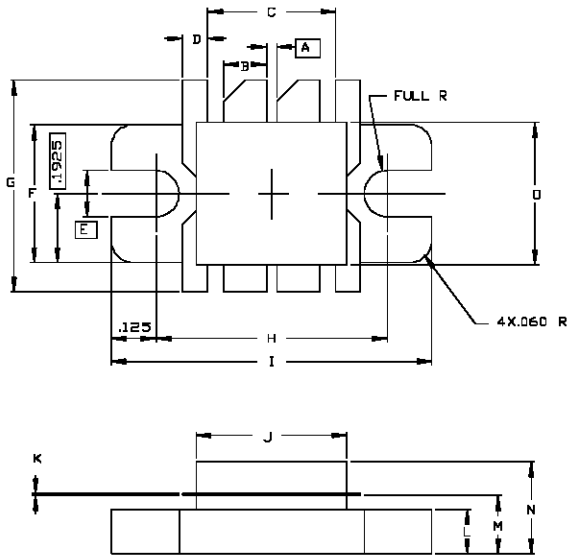



| FREQ. | $Z_{IN}$ (Ω) | $Z_{OUT}$ (Ω) |
|---|---|---|
| 170 MHz | 1.05 + j 0.65 | 13.5 – j 9.0 |
| 200 MHz | 0.9 + j 1.1 | 11.0 – j 6.5 |
| 230 MHz | 1.25 + j 1.8 | 9.5 – j 7.7 |

$V_{CE}$ = 28 V
$I_{CQ}$ = 2 x 2.5 A
Class A

## PACKAGE MECHANICAL DATA

Ref.: Dwg. No.12-0168




| SGS-THOMSON MICROELECTRONICS | | |
|---|---|---|
| | MINIMUM Inches/mm | MAXIMUM Inches/mm |
| A | .030/0,76 | |
| B | .115/2,92 | .125/3,18 |
| C | .360/9,14 | |
| D | .065/1,65 | .075/1,91 |
| E | .130/3,30 | |
| F | .380/9,65 | .390/9,91 |
| G | .735/18,67 | .765/19,43 |
| H | .645/16,38 | .655/16,64 |
| I | .895/22,73 | .905/22,99 |
| J | .420/10,67 | .430/10,92 |

| CONT'D | | |
|---|---|---|
| | MINIMUM Inches/mm | MAXIMUM Inches/mm |
| K | .003/0,08 | .007/0,18 |
| L | .120/3,05 | .130/3,30 |
| M | .159/4,04 | .175/4,45 |
| N | | .280/7,11 |
| O | .395/10,03 | .405/10,29 |
| | | |