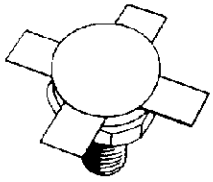
SGS-THOMSON MICROELECTRONICS

# SD1459

## RF & MICROWAVE TRANSISTORS TV/LINEAR APPLICATIONS

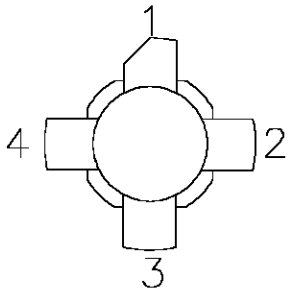
- 170 - 230 MHz
- 28 VOLTS
- COMMON EMITTER
- GOLD METALLIZATION
- HIGH SATURATED POWER CAPABILITY
- DIFFUSED EMITTER BALLAST RESISTORS
- $P_{OUT}$ = 20 W MIN. WITH 7.5 dB GAIN



**.500 Dia .550 4L STUD (M164)**
epoxy sealed

| ORDER CODE | BRANDING |
|---|---|
| SD1459 | SD1459 |

**PIN CONNECTION**




1. Collector
2. Emitter
3. Base
4. Emitter

### DESCRIPTION

The SD1459 is a gold metallized epitaxial silicon NPN planar transistor using diffused emitter ballast resistors for high linearity Class A 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 | 60 | V |
| $V_{CEO}$ | Collector-Emitter Voltage | 30 | V |
| $V_{EBO}$ | Emitter-Base Voltage | 4.0 | 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

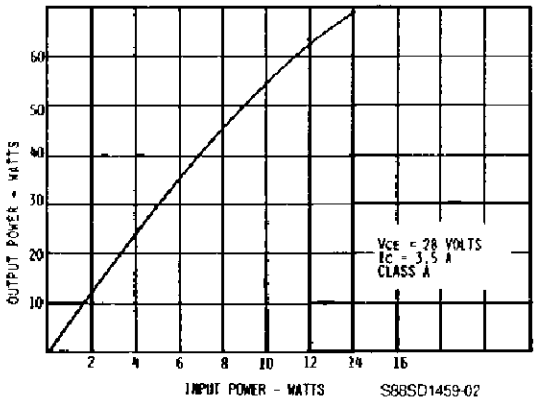
| Symbol | Test Conditions | | Value | | | Unit |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| $BV_{CBO}$ | $I_C$ = 100 mA | $I_E$ = 0 mA | 60 | — | — | V |
| $BV_{CEO}$ | $I_C$ = 100 mA | $I_B$ = 0 mA | 30 | — | — | V |
| $BV_{CER}$ | $I_C$ = 100 mA | $R_{BE}$ = 10Ω | 60 | — | — | V |
| $BV_{EBO}$ | $I_E$ = 20 mA | $I_C$ = 0 mA | 4.0 | — | — | V |
| $h_{FE}$ | $V_{CE}$ = 5 V | $I_C$ = 1 A | 10 | — | 120 | — |

DYNAMIC

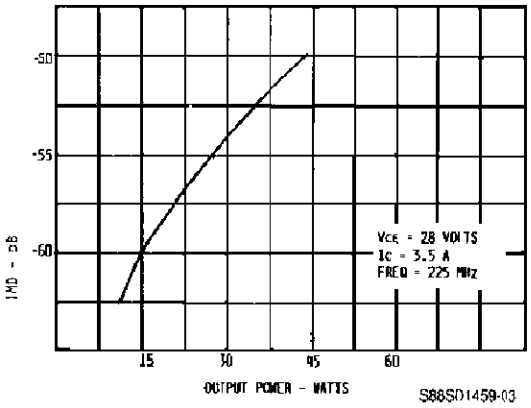
| Symbol | Test Conditions | | | Value | | | Unit |
|---|---|---|---|---|---|---|---|
| | | | | Min. | Typ. | Max. | |
| $P_{OUT}$ | f = 225 MHz | $V_{CE}$ = 28 V | $I_C$ = 3.5 A | 20 | — | — | W |
| $G_P$ | f = 225 MHz | $V_{CE}$ = 28 V | $I_C$ = 3.5 A | 7.5 | — | 8.0 | dB |
| $C_{OB}$ | f = 1 MHz | $V_{CB}$ = 30 V | | — | — | 150 | pf |
| Load Mismatch | f = 225 MHz | $V_{CE}$ = 28 V | $I_C$ = 3.5 A | ∞:1 | — | — | VSWR |

## TYPICAL PERFORMANCE

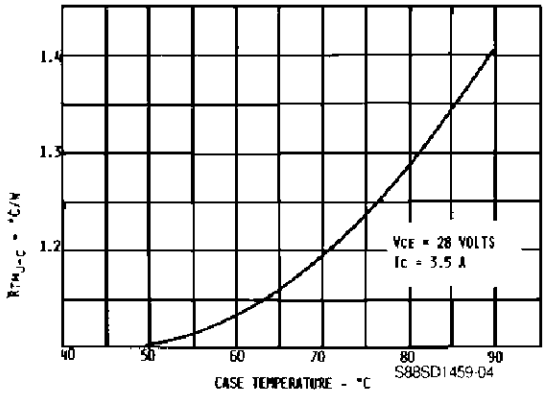
OUTPUT POWER vs INPUT POWER



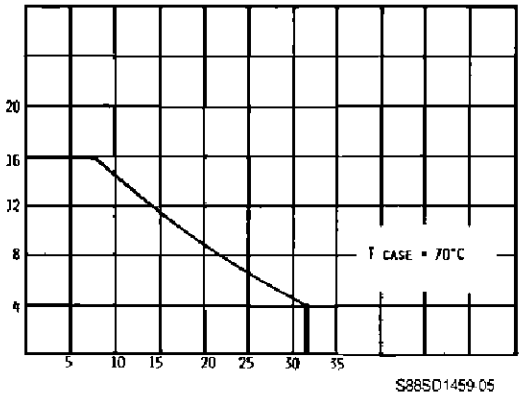

INTERMODULATION DISTORTION vs OUTPUT POWER




THERMAL RESISTANCE vs CASE TEMPERATURE

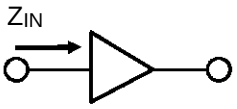



SAFE OPERATING AREA

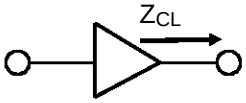


## IMPEDANCE DATA

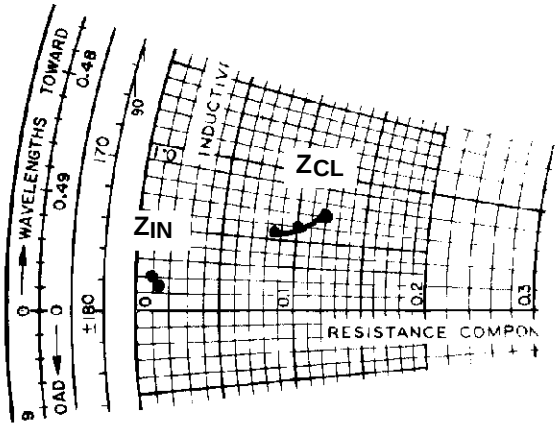
**TYPICAL INPUT IMPEDANCE**



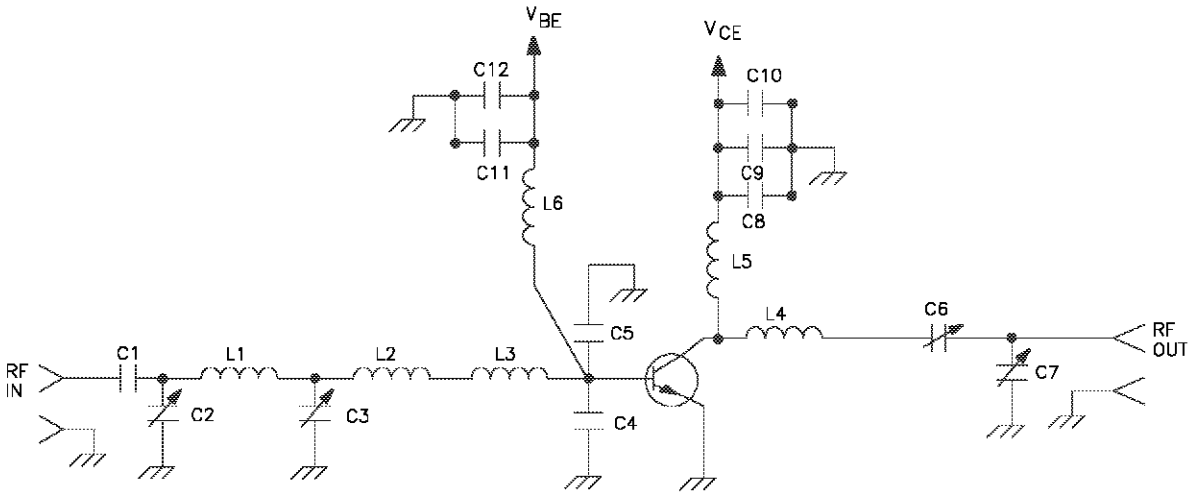

**TYPICAL COLLECTOR LOAD IMPEDANCE**




| FREQ. | $Z_{IN}$ (Ω) | $Z_{CL}$ (Ω) |
|---|---|---|
| 170 MHz | 0.6 + j 0.7 | 5.9 + j 3.5 |
| 200 MHz | 0.55 + j 0.8 | 5.0 + j 3.0 |
| 230 MHz | 0.5 + j 0.9 | 4.2 + j 2.8 |




## TEST CIRCUIT FOR 225 MHz



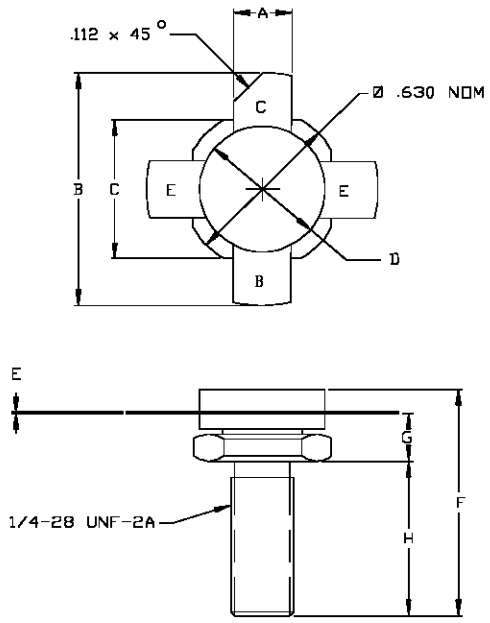

| | | |
|---|---|---|
| C1, C10 | : | 470 pF ATC 100 B Chip Capacitor |
| C2 | : | 4 - 40pF Arco 403 Trimmer Capacitor |
| C3 | : | 4 - 60pF Arco 404 Trimmer Capacitor |
| C4, C5 | : | 82pF ATC 100B Chip Capacitor |
| C6 | : | 24 - 200pF Arco 425 Trimmer Capacitor |
| C7 | : | 10 - 80pF Arco 405 Trimmer Capacitor |
| C8, C11 | : | 1µF LCC Chip Capacitor |
| C9 | : | 100µF 63V Electrolytic |
| C12 | : | 10mF LCC CPM13B |

| | | |
|---|---|---|
| L1 | : | 1 1/2 Turns, 0.7mm Enameled Wire 4.5mm I.D. |
| L2 | : | 21mm 50Ω Line |
| L3 | : | Length of the Base Lead |
| L4 | : | Enameled Wire 1.6mm Diameter |
| L5 | : | Enameled Wire 1.6mm Diameter |
| L6 | : | 9 Turns 0.7mm Enameled Wire 4.5mm 1.D. |

Material: Epoxy 63 Mils Er = 2.55

## PACKAGE MECHANICAL DATA

Ref.: Dwg. No.12-0164




| SGS-THOMSON MICROELECTRONICS | | |
|---|---|---|
| | MINIMUM Inches/mm | MAXIMUM Inches/mm |
| A | .220/5,59 | .230/5,84 |
| B | | 1.050/26,67 |
| C | .545/13,84 | .555/14,10 |
| D | .495/12,57 | .505/12,83 |
| E | .003/0,08 | .007/0,18 |
| F | | .830/21,08 |
| G | .185/4,70 | .198/5,03 |
| H | .497/12,62 | .530/13,46 |
| | | |
| | | |