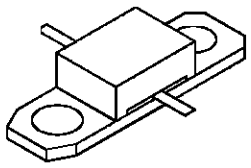
SGS-THOMSON MICROELECTRONICS

# SD1897

## RF & MICROWAVE TRANSISTORS 1.65 GHz SATCOM APPLICATIONS

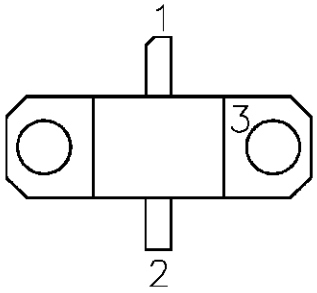
- 1.65 GHz
- 28 VOLTS
- CLASS C OPERATION
- COMMON BASE
- $P_{OUT}$ = 10 W MIN. WITH 11.0 dB GAIN



**.250 x .320 2LFL (M170)**
epoxy sealed

| ORDER CODE | BRANDING |
|---|---|
| SD1897 | 1897 |

**PIN CONNECTION**




1. Collector
2. Emitter
3. Base

### DESCRIPTION

The SD1897 is a 28 V Class C silicon NPN transistor designed for INMARSAT and other 1.65 GHz SATCOM applications. A gold metallized emitter-ballasted die geometry is employed providing high gain and efficiency while ensuring long term reliability and ruggedness under severe operating conditions. SD1897 is packaged in a cost-effective epoxy sealed housing.

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

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $V_{CBO}$ | Collector-Base Voltage | 45 | V |
| $V_{CEO}$ | Collector-Emitter Voltage | 15 | V |
| $V_{EBO}$ | Emitter-Base Voltage | 3.5 | V |
| $I_C$ | Device Current | 2.3 | A |
| $P_{DISS}$ | Power Dissipation | 29 | 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 | 6.0 | °C/W |

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

STATIC

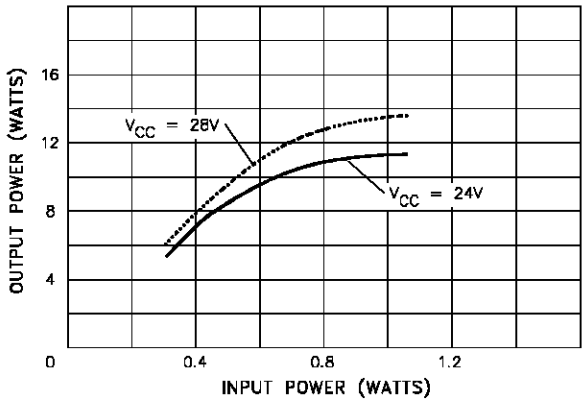
| Symbol | Test Conditions | | Value | | | Unit |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| $BV_{CBO}$ | $I_C$ = 3mA | $I_E$ = 0mA | 45 | — | — | V |
| $BV_{CEO}$ | $I_C$ = 3mA | $I_B$ = 0mA | 12 | — | — | V |
| $BV_{EBO}$ | $I_E$ = 3mA | $I_C$ = 0mA | 3.5 | — | — | V |
| $h_{FE}$ | $V_{CE}$ = 5V | $I_C$ = 600mA | 15 | — | 150 | — |

DYNAMIC

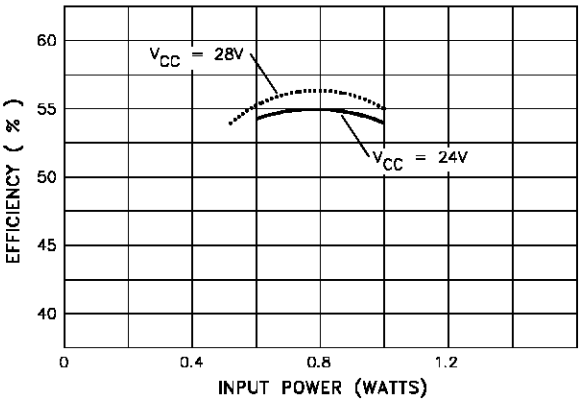
| Symbol | Test Conditions | | | Value | | | Unit |
|---|---|---|---|---|---|---|---|
| | | | | Min. | Typ. | Max. | |
| $P_{OUT}$ | f = 1.65 GHz | $P_{IN}$ = 0.8 W | $V_{CE}$ = 28 V | 10 | — | — | W |
| $G_P$ | f = 1.65 GHz | $P_{IN}$ = 0.8 W | $V_{CE}$ = 28 V | 11 | — | — | dB |
| $\eta_c$ | f = 1.65 GHz | $P_{IN}$ = 0.8 W | $V_{CE}$ = 28 V | 48 | — | — | % |

## TYPICAL PERFORMANCE

**POWER OUTPUT vs POWER INPUT**



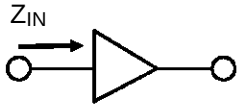

**EFFICIENCY vs POWER INPUT**



## IMPEDANCE DATA

**TYPICAL INPUT IMPEDANCE**

$Z_{IN}$



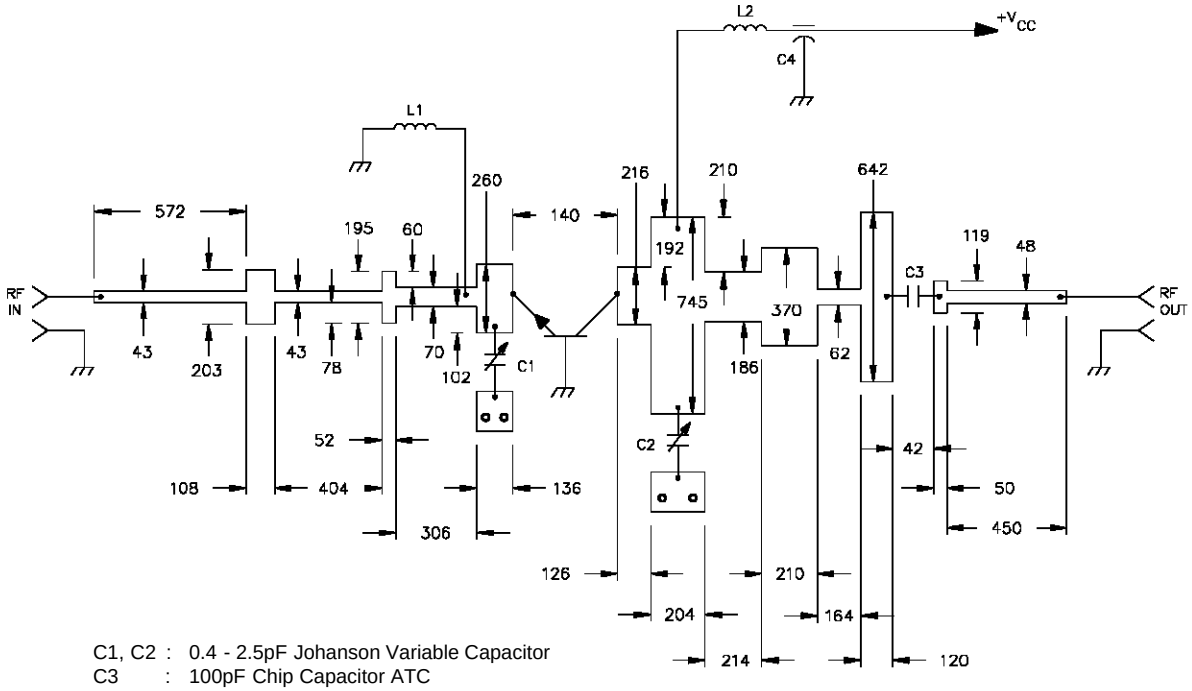
**TYPICAL COLLECTOR LOAD IMPEDANCE**

$Z_{CL}$

| FREQ. | $Z_{IN}$ (Ω) | $Z_{CL}$ (Ω) |
|---|---|---|
| 1600 MHz | 22.0 + j 23.0 | 3.1 + j 4.0 |
| 1650 MHz | 28.0 + j 18.0 | 3.0 + j 2.0 |

$P_{OUT}$ = 10 W
$V_{CE}$ = 28 V
$P_{IN}$ = 0.8 W

## TEST CIRCUIT



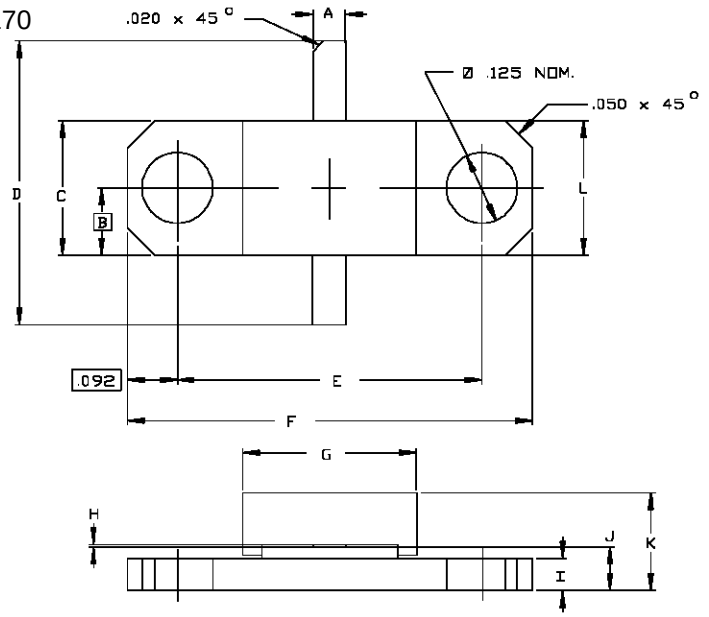

C1, C2 : 0.4 - 2.5pF Johanson Variable Capacitor
C3 : 100pF Chip Capacitor ATC
C4 : Suppression Filters CDI 9900381-6004

L1, L2 : 4 Turns, Choke #28 AWG .080" I.D.

Substrate: Er = 10.2, Height .050", 1 Oz. Cu.
All Dimensions in mm unless otherwise specified

## PACKAGE MECHANICAL DATA

Ref.: Dwg. No.12-0170




| SGS-THOMSON MICROELECTRONICS | | |
|---|---|---|
| | MINIMUM Inches/mm | MAXIMUM Inches/mm |
| A | .055/1,40 | .065/1,65 |
| B | .124/3,15 | |
| C | .243/6,17 | .253/6,43 |
| D | .635/16,13 | .665/16,89 |
| E | .555/14,10 | .565/14,35 |
| F | .739/18,77 | .749/19,02 |
| G | .315/8,00 | .325/8,26 |
| H | .002/0,05 | .006/0,15 |
| I | .055/1,40 | .065/1,65 |
| J | .075/1,91 | .095/2,41 |

| CONT'D | | |
|---|---|---|
| | MINIMUM Inches/mm | MAXIMUM Inches/mm |
| K | | .190/4,83 |
| L | .245/6,22 | .255/6,48 |
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