

SILICON POWER TRANSISTOR  
2SC3218-M

NPN SILICON EPITAXIAL TRANSISTOR  
FOR 860-MHz WIDEBAND POWER AMPLIFIER  
INDUSTRIAL USE

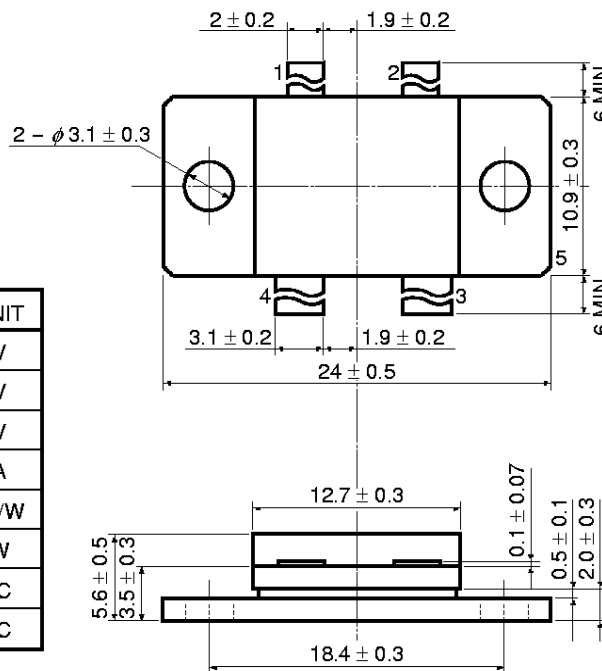
FEATURES

- High gain and high power output at 860 MHz  
 $P_{out} = 52 \text{ W @ } V_{CC} = 28 \text{ V, } P_{in} = 10 \text{ W, class AB}$
- Push-pull structure allows easy design of wideband amplifier
- Internal emitter balance resistor
- Internal impedance matching circuit
- High reliability due to gold electrodes

ABSOLUTE MAXIMUM RATINGS ( $T_A = 25 \text{ }^\circ\text{C}$ )

PARAMETER	SYMBOL	RATINGS	UNIT
Collector to Base Voltage	$V_{CBO}$	55	V
Collector to Emitter Voltage	$V_{CEO}$	32	V
Emitter to Base Voltage	$V_{EBO}$	3	V
Collector Current	$I_C$	15	A
Thermal Resistance (junction to case)	$R_{th(j-c)}$	1.09	$^\circ\text{C/W}$
Total Power Dissipation	$P_T(T_C = 25 \text{ }^\circ\text{C})$	160	W
Junction Temperature	$T_j$	200	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-65 to +150	$^\circ\text{C}$

PACKAGE DIMENSIONS (in millimeters)



PIN CONNECTIONS

1. Collector
2. Collector
3. Base
4. Base
5. Emitter (heat sink)

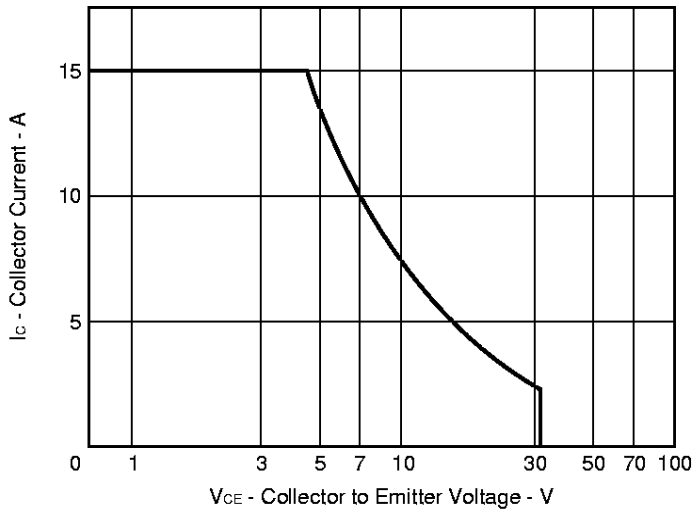
ELECTRICAL CHARACTERISTICS ( $T_A = 25 \text{ }^\circ\text{C}$ )

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	$I_{CBO}$	$V_{CB} = 30 \text{ V, } I_E = 0$			4	mA
Emitter Cut-off Current	$I_{EBO}$	$V_{EB} = 2 \text{ V, } I_C = 0$			4	mA
DC Current Gain	$h_{FE}$ <sup>Note</sup>	$V_{CE} = 10 \text{ V, } I_C = 1 \text{ A (pulse)}$	20	60	120	-
Output Power	$P_{out}$	$f = 860 \text{ MHz, } V_{CC} = 28 \text{ V}$ $P_{in} = 10 \text{ W (40 dBm)}$	46.2	47.2		dBm
			42	52		W
Collector Efficiency	$\eta_C$	$I_C = 150 \text{ mA} \times 2, \text{ class AB}$	40	50		%
Feedback Capacitance	$C_{re}$ <sup>Note</sup>	$V_{CB} = 28 \text{ V, } f = 1 \text{ MHz, } I_E = 0$		40	60	pF

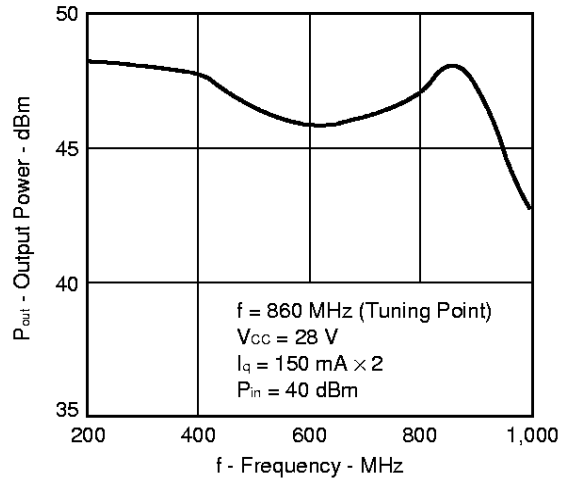
Note Per unit

TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25 °C)

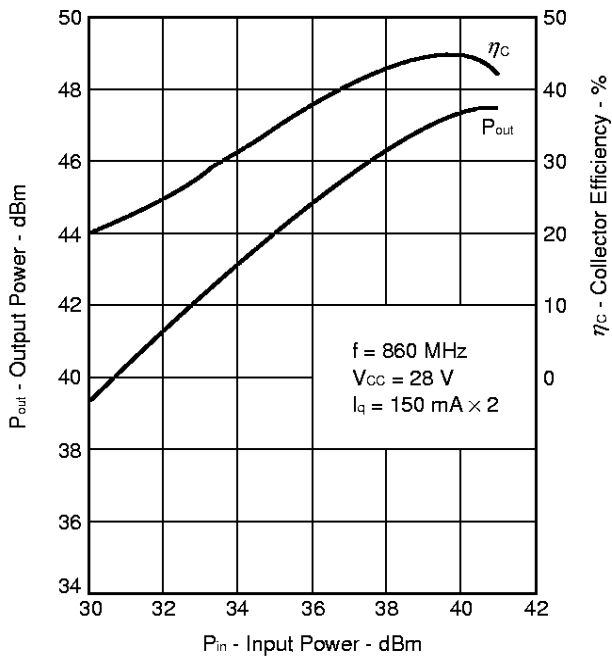
FORWARD BIAS SAFE OPERATING AREA (DC)



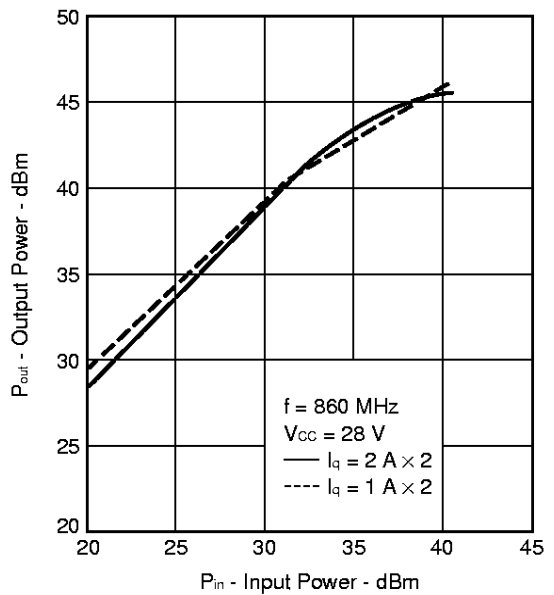
FREQUENCY RESPONSE



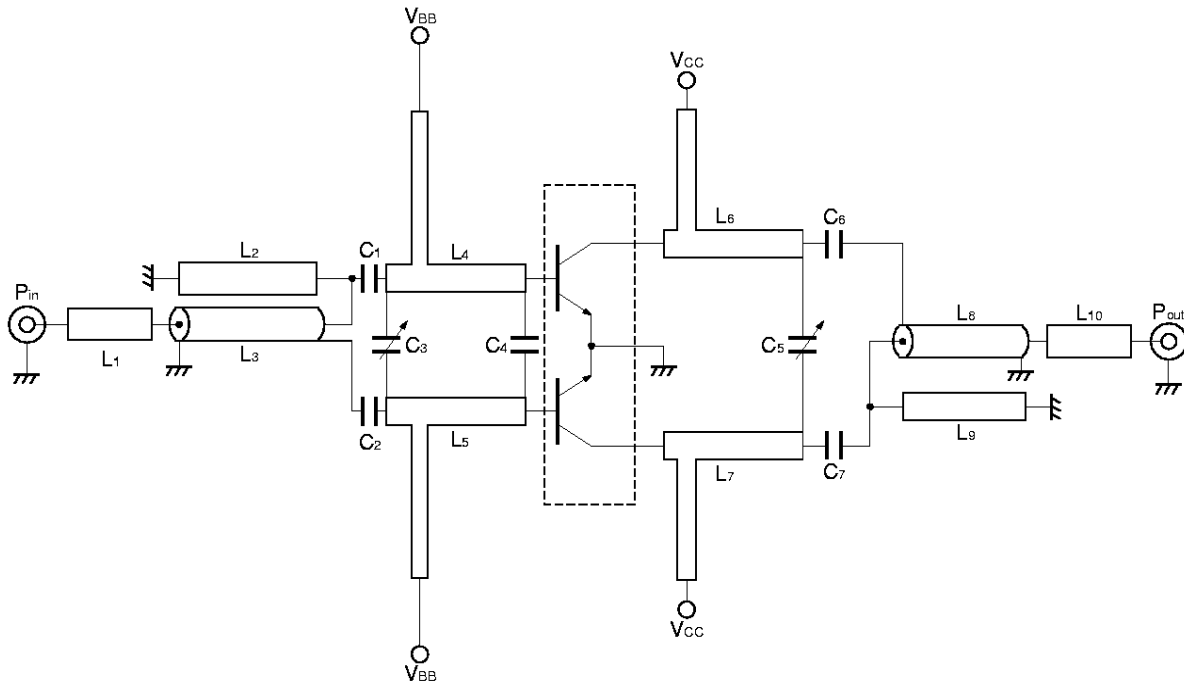
OUTPUT POWER AND COLLECTOR EFFICIENCY vs. INPUT POWER



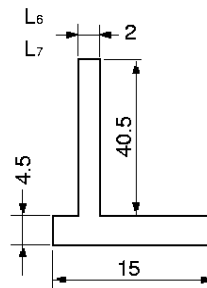
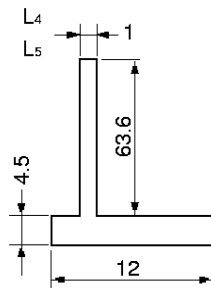
OUTPUT POWER vs. INPUT POWER



APPLICATION CIRCUIT EXAMPLE



- C<sub>1</sub> = C<sub>2</sub> = 20 pF
- C<sub>3</sub> = 20 pF
- C<sub>4</sub> = 10 pF
- C<sub>5</sub> = 20 pF
- C<sub>6</sub> = C<sub>7</sub> = 75 pF
- L<sub>1</sub> L<sub>10</sub> Micro-strip line 23.6 × 4.5 mm
- L<sub>2</sub> L<sub>9</sub> 50 Ω Semi-rigid cable 70 mm
- L<sub>4</sub> to L<sub>7</sub> Micro-strip line (in millimeters)



Substrate material: Teflon glass t = 1.6 mm

**CAUTIONS ON HANDLING DEVICES**

This device employs beryllia ceramics (beryllium oxide) internally. Inhalation of beryllium oxide powder or vapor into the human respiratory system may cause hazards such as breathing difficulties and other problems.

Therefore, do not disintegrate or chemically process this device.

Moreover, when disposing of this device, be sure to separate it from general industrial waste and domestic garbage.

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Anti-radioactive design is not implemented in this product.