

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

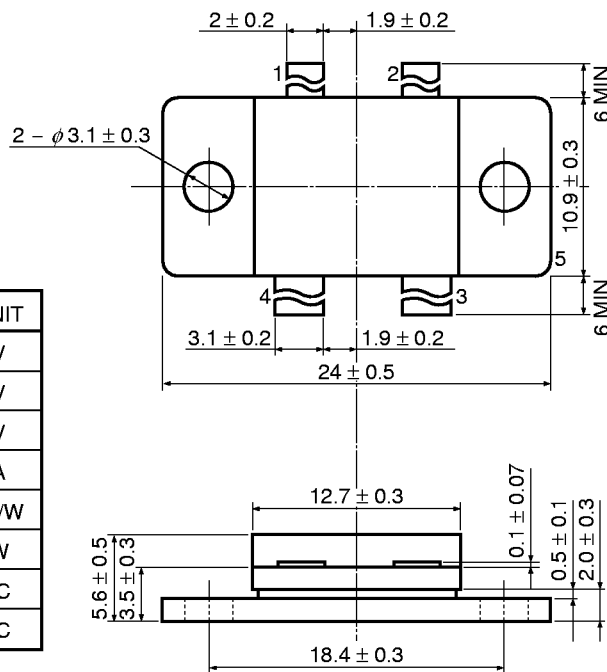
FEATURES

- 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)

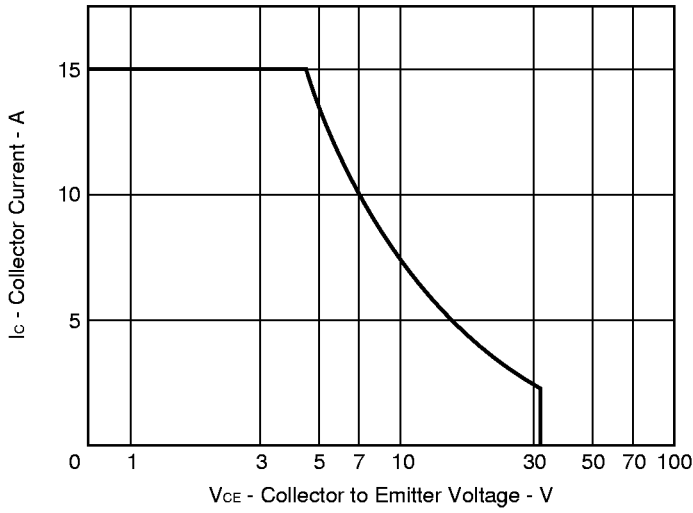
ELECTRICAL CHARACTERISTICS ($T_A = 25 \text{ }^\circ\text{C}$)

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} Note	$V_{CE} = 10 \text{ V, } I_C = 1 \text{ A (pulse)}$	20	60	120	-
Output Power	P_{out}	$f = 860 \text{ MHz, } V_{CC} = 28 \text{ V}$	46.2	47.2		dBm
		$P_{in} = 10 \text{ W (40 dBm)}$	42	52		W
Collector Efficiency	η_C	$I_q = 150 \text{ mA} \times 2, \text{ class AB}$	40	50		%
Feedback Capacitance	C_{re} Note	$V_{CB} = 28 \text{ V, } f = 1 \text{ MHz, } I_E = 0$		40	60	pF

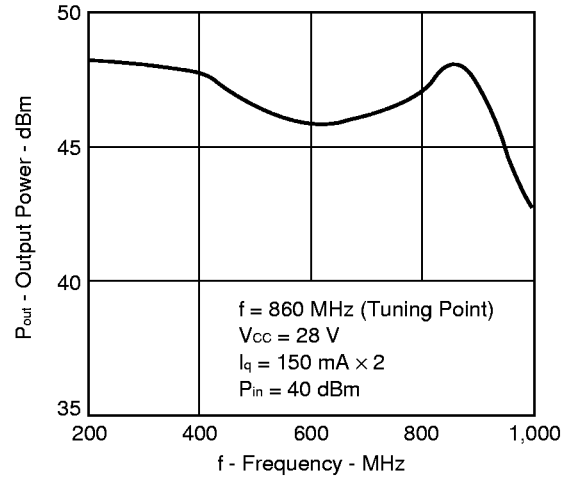
Note Per unit

TYPICAL CHARACTERISTICS (T_A = 25 °C)

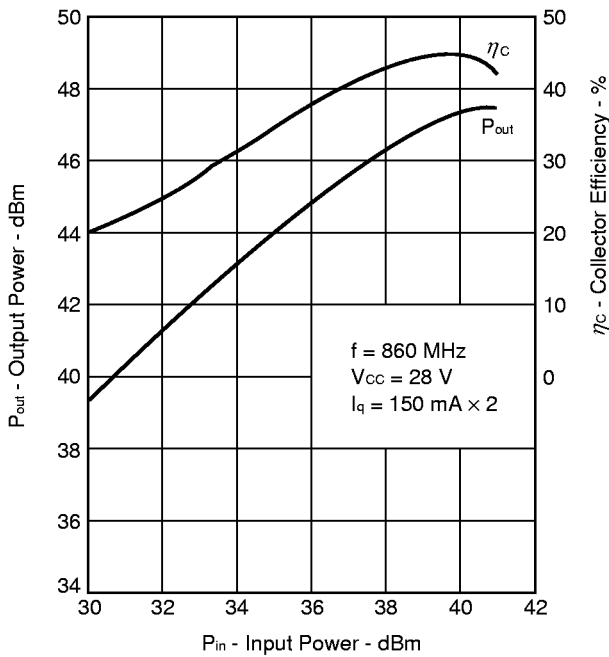
FORWARD BIAS SAFE OPERATING AREA (DC)



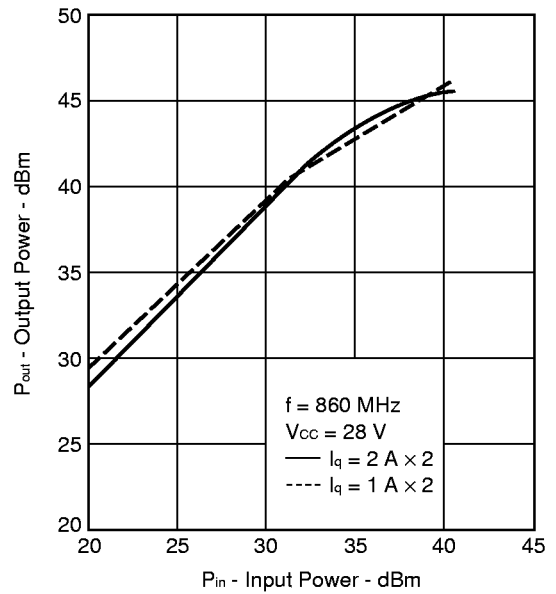
FREQUENCY RESPONSE



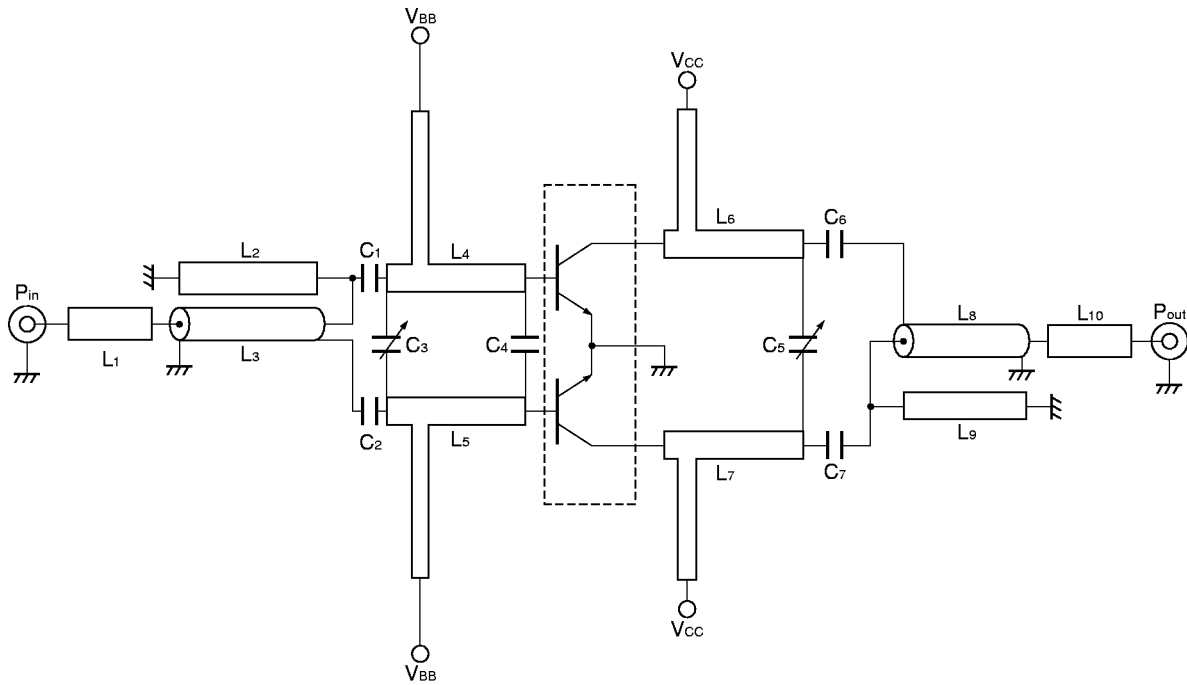
OUTPUT POWER AND COLLECTOR EFFICIENCY vs. INPUT POWER



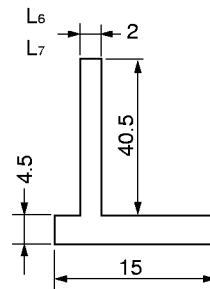
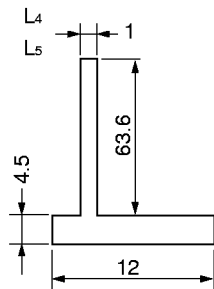
OUTPUT POWER vs. INPUT POWER



APPLICATION CIRCUIT EXAMPLE



- C₁ = C₂ = 20 pF
- C₃ = 20 pF
- C₄ = 10 pF
- C₅ = 20 pF
- C₆ = C₇ = 75 pF
- L₁ L₁₀ Micro-strip line 23.6 × 4.5 mm
- L₂ L₉ 50 Ω Semi-rigid cable 70 mm
- L₄ to L₇ Micro-strip line (in millimeters)



Substrate material: Teflon glass t = 1.6 mm