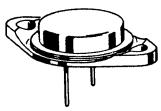
2N2947 (SILICON)
2N2948



NPN silicon annular transistors for power amplifier applications to 100 MHz.

CASE 1
(TO-3)

Collector connected to case

MAXIMUM RATINGS*

Rating	Symbol	2N2947	2N2948	Unit
Collector-Base Voltage	V_{CB}	60	40	Vdc
Collector-Emitter Voltage	V_{CES}	60	40	Vdc
Emitter - Base Voltage	V_{EB}	3.0	2.0	Vdc
Collector-Current (continuous)	I_C	1.5		Adc
Base-Current (continuous)	I_B	500		mAdc
Power Input (Nominal)	P_{in}	5.0		Watts
Power Output (Nominal)	P_{out}	20.0		Watts
Total Device Dissipation @ 25°C Case Temperature	P_D	25.0		Watts
Derating Factor above 25°C		167		mW/°C
Junction Temperature	T_J	175		°C
Storage Temperature Range	T_{stg}	-65 to + 175		°C

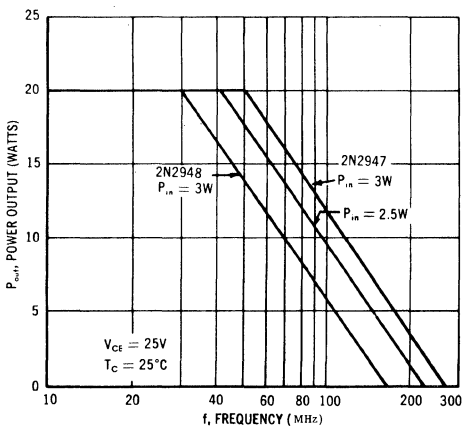
*The maximum ratings as given for dc conditions can be exceeded on a pulse basis. See electrical characteristics.

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

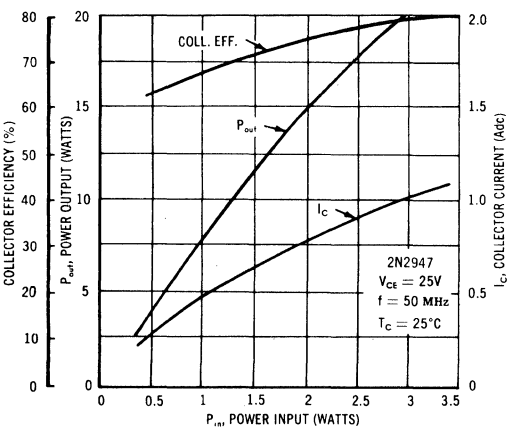
Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector-Emitter Sustain Voltage	$V_{CES(sus)}$ (1)	2N2947: I_C = 0.250 A, R_{BE} = 0	90	120	--	Volts
		2N2948: I_C = 0.250A, R_{BE} = 0	80	100	--	
Collector-Emitter-Open Base Sustain Voltage	$V_{CEO(sus)}$ (1)	2N2947: I_C = 0.250A, I_B = 0	40	--	--	Volts
		2N2948: I_C = 0.250A, I_B = 0	20	--	--	
Collector-Emitter Current	I_{CES}	2N2947: V_{CE} = 60 Vdc, V_{BE} = 0	--	--	0.5	mAdc
		V_{CE} = 50 Vdc, V_{BE} = 0, T_C = 175°C	--	--	1.0	
		2N2948: V_{CE} = 40 Vdc, V_{BE} = 0	--	--	0.5	
		V_{CE} = 30 Vdc, V_{BE} = 0, T_C = 175°C	--	--	1.0	
Collector Cutoff Current	I_{CBO}	2N2947: V_{CB} = 50 Vdc, I_E = 0	--	--	**1.0**	μAdc
		2N2948: V_{CB} = 30 Vdc, I_E = 0	--	--	**1.0**	
Emitter Cutoff Current	I_{EBO}	2N2947: V_{EB} = 3 Vdc, I_C = 0	--	--	100	μAdc
		2N2948: V_{EB} = 2 Vdc, I_C = 0	--	--	100	
DC Current Gain	h_{FE}	2N2947: I_C = 400 mAdc, V_{CE} = 2Vdc	6.0	--	60	
		2N2948: I_C = 400 mAdc, V_{CE} = 2 Vdc	2.5	--	100	
		Both Types: I_C = 1 Adc, V_{CE} = 2 Vdc	2.5	--	--	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C = 1.0 Adc, I_B = 500 mAdc	--	--	0.5	Vdc
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	I_C = 1.0 Adc, I_B = 500 mAdc	--	--	2.0	Vdc
AC Current Gain	$\|h_{fe}\|$	V_{CE} = 2.0 Vdc, I_C = 400 mAdc, f = 50 MHz	2.0	--	--	
Collector Output Capacitance	C_{ob}	V_{CB} = 25 Vdc, I_E=0, f = 100 kHz	--	--	60	pF
Power Input	P_{in}	P_{out} = 15 W, f = 50 MHz, V_{CE} = 25 Vdc	--	2.0	3.0	Watts
Efficiency	η	$I_{C(max)}$ = 1A 2N2947	60	80	--	%
Power Input	P_{in}	P_{out} = 15 W, f = 30 MHz, V_{CE} = 25 Vdc	--	2.0	3.0	Watts
Efficiency	η	$I_{C(max)}$ = 1.0 A 2N2948	60	70	--	%

(1) Pulse Measurement: Pulse Width ≤ 100 μs, Duty Cycle = 2.0%.

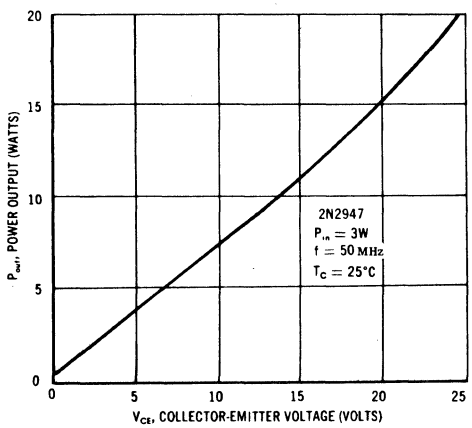
POWER OUTPUT versus FREQUENCY



OUTPUT CHARACTERISTICS versus POWER INPUT



POWER OUTPUT versus COLLECTOR VOLTAGE



POWER OUTPUT versus POWER INPUT