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2N4048

PNP germanium power transistors designed for high-current applications requiring high gain and extremely low saturation voltage.

Collector connected to case

MAXIMUM RATINGS

Rating	Symbol		Unit
Collector-Emitter Voltage	V_{CEO}	30	Vdc
Collector-Emitter Voltage	V_{CES}	45	Vdc
Collector-Base Voltage	V_{CB}	45	Vdc
Emitter-Base Voltage	V_{EB}	25	Vdc
Collector Current — Continuous	I_C*	← 60 →	Adc
Total Device Dissipation @ T_C = 25°C	P_D	← 170 →	Watts
Derate above 25°C		← 2.0 →	W/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +110	°C

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage† (I_C = 1.0 Adc, I_B = 0)	BV_{CEO}†	30	-	Vdc
Collector-Emitter Breakdown Voltage (I_C = 300 mAdc, V_{BE} = 0)	BV_{CES}	45	-	Vdc
Floating Potential (V_{CB} = 45 Vdc, I_E = 0)	V_{EBF}	-	0.5	Vdc
Collector Cutoff Current (V_{CE} = 30 Vdc, $V_{BE(off)}$ = 2.0 Vdc, T_C = +71°C)	I_{CEX}	-	15	mAdc
Collector Cutoff Current (V_{CB} = 2.0 Vdc, I_E = 0)	I_{CBO}	-	0.2	mAdc
(V_{CB} = 45 Vdc, I_E = 0)		-	4.0	
Emitter Cutoff Current (V_{BE} = 25 Vdc, I_C = 0)	I_{EBO}	-	4.0	mAdc
(V_{BE} = 25 Vdc, I_C = 0, T_C = +71°C)		-	15	
ON CHARACTERISTICS				
DC Current Gain† (I_C = 15 Adc, V_{CE} = 2.0 Vdc)	h_{FE}†	60	180	-
(I_C = 60 Adc, V_{CE} = 2.0 Vdc)		15	-	
Collector-Emitter Saturation Voltage† (I_C = 15 Adc, I_B = 1.0 Adc)	$V_{CE(sat)}$†	-	0.15	Vdc
(I_C = 60 Adc, I_B = 6.0 Adc)		-	0.3	
Base-Emitter Saturation Voltage† (I_C = 15 Adc, I_B = 1.0 Adc)	$V_{BE(sat)}$†	-	0.6	Vdc
(I_C = 60 Adc, I_B = 6.0 Adc)		-	1.0	
SMALL SIGNAL CHARACTERISTICS				
Common-Emitter Cutoff Frequency (I_C = 15 Adc, V_{CE} = 2.0 Vdc)	$f_{\alpha e}$	2.0	-	kHz

† To avoid excessive heating of the collector junction, perform test with pulse method.