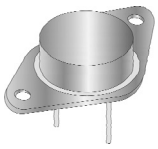
Bipolar Transistor

multicomp PRO



RoHS Compliant

Description

This transistor is designed for high–voltage, high–speed, power switching in inductive circuits where fall time is critical. They are particularly suited for 115 and 220 volt line operated switch–mode applications

Features

- High Temperature Performance Specified for:
- Reversed Biased SOA with Inductive Loads
- Switching Times with Inductive Loads
- Saturation Voltages
- Leakage Currents

Application

- Switching Regulators
- PWM Inverters and Motor Controls
- Solenoid and Relay Drivers
- Deflection Circuits

Absolute Maximum Ratings (Ta = 25°C)

Description	Symbol	2N6052	Unit
Collector-Emitter Voltage	$V_{CEO\ (sus)}$	400	V DC
Collector-Emitter Voltage	$V_{CEX(sus)}$	450	
Collector-Emitter Voltage	V_{CEv}	850	
Emitter Base Voltage	V_{EB}	9	
Collector Current – Continuous – Peak (2)	I_C I_{CM}	15 30	A DC
Base Current – Continuous – Peak (2)	I_B I_{BM}	10 20	
Emitter Current – Continuous – Peak (2)	I_E I_{EM}	25 35	
Total Power Dissipation @ Tc = 25°C @ Tc = 100°c Derate above 25°C	P_D	175 100 1	Watts W/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200	ºC

Thermal Resistance

Description	Symbol	Value	Unit
Thermal Resistance, Junction to Case	R_{JC}	1	ºC/W
Maximum Lead Temperature for Soldering Purposes: 1/8 from Case for 5 Seconds	T_L	275	°C

Electrical Characteristics

Parameter	Symbol	Test Condition	Min.	Max.	Unit
Collector-Emitter Sustaining Voltage	$V_{CEO(sus)}$	I_C=100mA, I_B=0	400	--	V DC
Collector-Emitter Sustaining Voltage	$V_{CEX(sus)}$	IC = 8A V_{clamp}-Rated V_{CEX}, T_C=100°C	300	--	
Collector Cut off Current	I_{CEV}	V_{CEV} = Rated Value, $V_{BE(off)}$ = 1.5V DC) V_{CE} = Rated Value, $V_{BE(off)}$ = 1.5V DC), TC = 100°C	--	1 4	mAdc
Collector Cut Off Current	I_{CER}	V_{CE} = Rated V_{CEV}, R_{BE} = 150, TC = 100°C		5	
Emitter Cut Off Current	I_{EBO}	V_{BE}=9V, I_C=0		1	
Second Breakdown					
Second Breakdown Collector Current with base forward biased	$I_{S/b}$	t = 1 s (non-repetitive) (V_{CE} =100 V_{DC})	0.2	--	A DC
On Characteristics (1)					
DC Current Gain	h_{FE}	I_C=5A, V_{CE}=2V DC	1.2	60	
		I_C=10ADC, V_{CE}=2V	6	30	
Collector Emitter Saturation Voltage	$V_{CE\ (sat)}$	I_C=10A DC, I_B=2A DC	--	1.5	V DC
		I_C=15A DC, I_B=3A DC		5	
		I_C=10A DC, I_B=2A DC, T_C = 100°C		2.5	
Base Emitter Saturation Voltage	$V_{BE(sat)}$	I_C=10A DC, I_B=2A DC		1.6	
		I_C=10A DC, I_B=2A DC, T_C = 100°C			
Dynamic Characteristic					
Current-Gain — Bandwidth Product	f_T	I_C=500mAdc, V_{CE}=10Vdc, f_{test}=1KHz	6	28	MHz
Output Capacitance	C_{ob}	V_{CB} = 10V DC, I_E = 0, f_{test}=1KHz	125	500	pF
Switching Characteristics					
Resistive Load					
Delay Time	td	(V_{CC} =250 V, I_C = 10A I_{B1} = I_{B2} = 2A, t_p = 100 s Duty Cycle ≤ 2%	--	0.05	u s
Rise Time	t_r			1	
Storage Time	t_s			4	
Fall Time	t_f			0.7	
Inductive Load, Clamped					
Storage Time	t_s	I_C = 10 A(pk), V_{clamp} = Rated V_{CEX}, I_{B1} = 2A $V_{BE(OFF)}$ = 5V DC, T_C = 100°C	--	5	u s
Fall Time	t_f			1.5	
			Typical		
Storage Time	t_s	I_C = 10 A(pk), V_{clamp} = Rated V_{CEX}, I_{B1} = 2A $V_{BE(OFF)}$ = 5V DC, T_C = 25°C	2		u s
Fall Time	t_f		0.09		

(1) Pulse Test : Pulse Width = 300 s, Duty Cycle = 2%

Typical Characteristics Curves

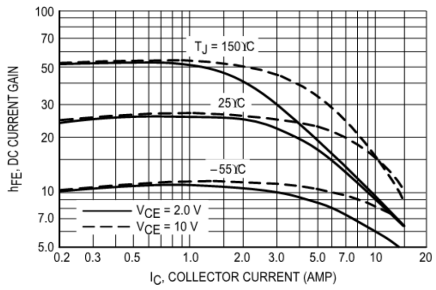


Figure 1. DC Current Gain

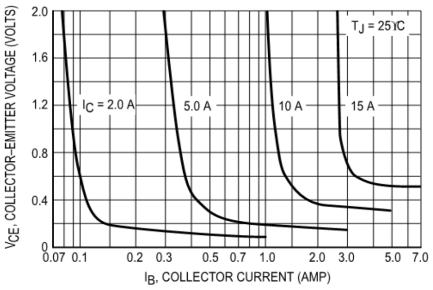


Figure 2. Collector Saturation Region

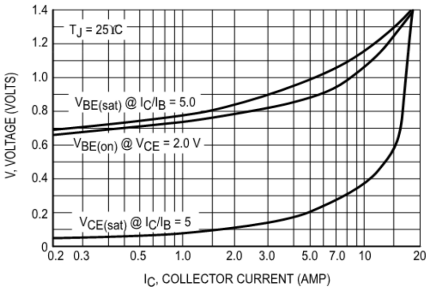


Figure 3. “On” Voltages

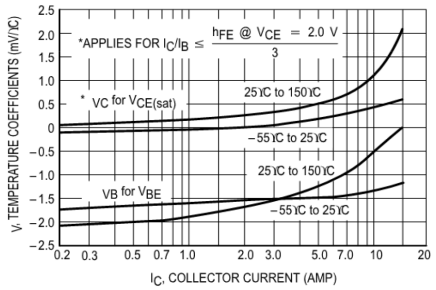


Figure 4. Temperature Coefficients

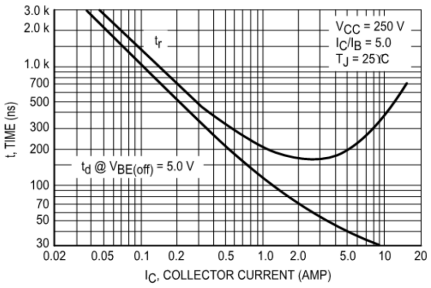


Figure 5. Turn–On Time

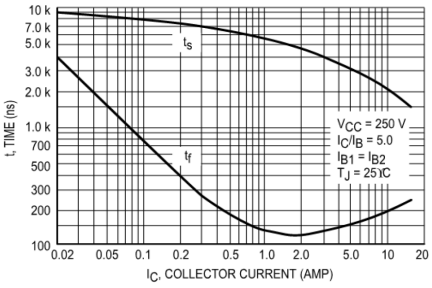


Figure 6. Turn–Off Time

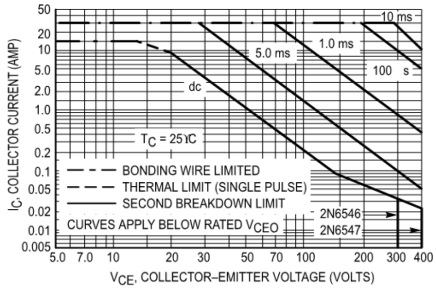


Figure 7. Forward Bias Safe Operating Area

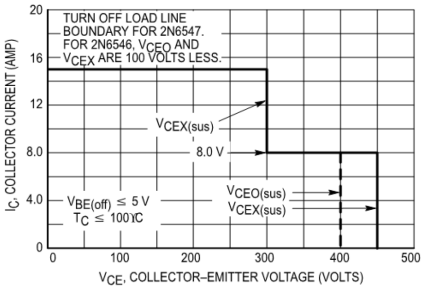


Figure 8. Reverse Bias Safe Operating Area

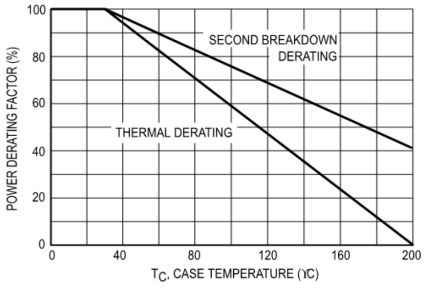


Figure 9. Power Derating

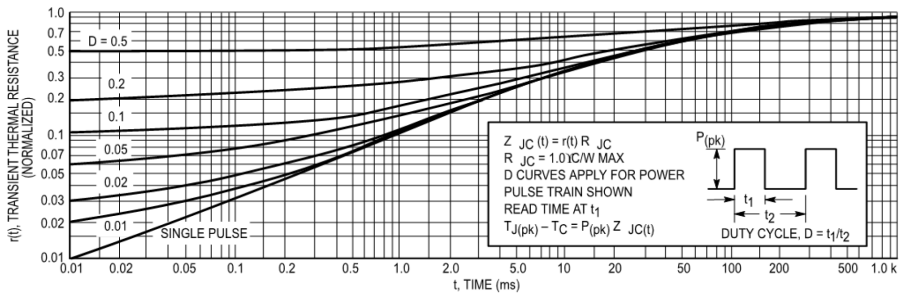
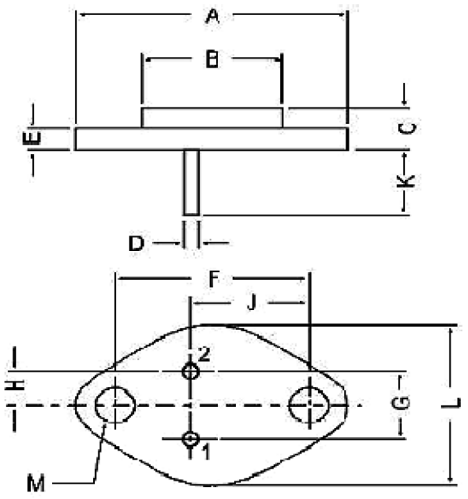


Figure 10. Thermal Response

Bipolar Transistor

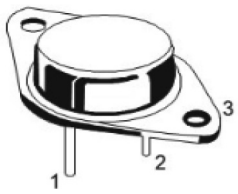
Package Details



DIM	MIN	MAX
A	--	39.37
B	--	22.22
C	6.35	8.5
D	0.96	1.09
E	--	1.77
F	29.9	30.4
G	10.69	11.18
H	5.2	5.72
J	16.64	17.15
K	11.15	12.25
L	--	26.67
M	3.84	4.19

PIN CONFIGURATION

1. BASE
2. EMITTER
3. COLLECTOR



Part Number Table

Description	Part Number
Bipolar Transistor, PNP, 400V, 15A, TO-3	2N6547

Dimensions : Millimetres