

**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	°C

Thermal Resistance

Description	Symbol	Value	Unit
Thermal Resistance, Junction to Case	R_{JC}	1	°C/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)}	I _C = 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), T _C = 100°C	--	1 4	mAdc
Collector Cut Off Current	I _{CER}	V _{CE} = Rated V _{CEV} , R _{BE} = 150, T _C = 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	t _d	(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

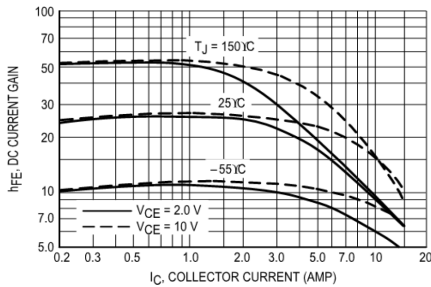


Figure 1. DC Current Gain

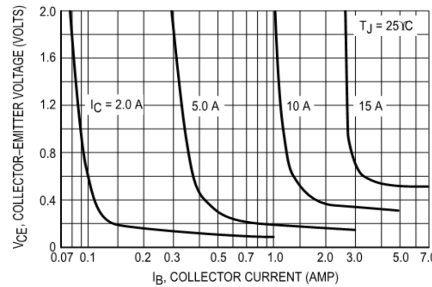


Figure 2. Collector Saturation Region

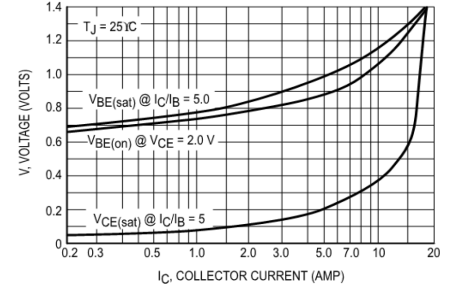


Figure 3. "On" Voltages

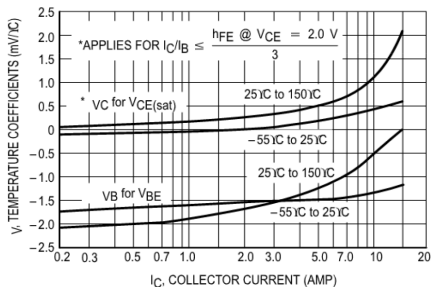


Figure 4. Temperature Coefficients

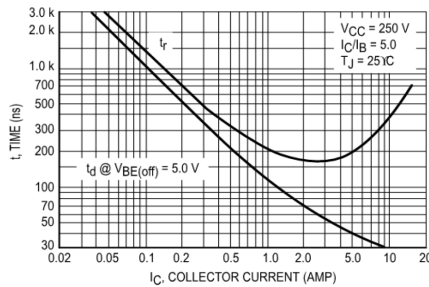


Figure 5. Turn-On Time

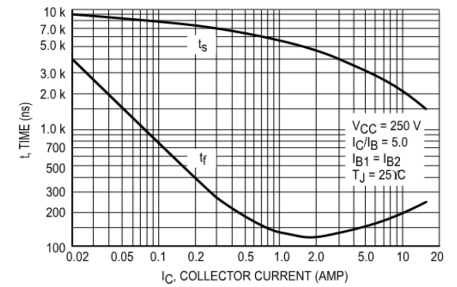


Figure 6. Turn-Off Time

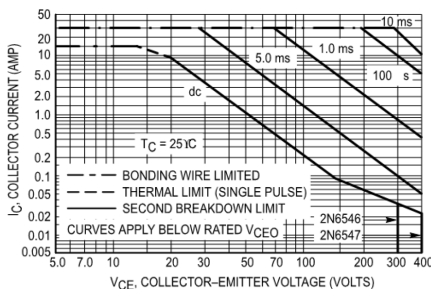


Figure 7. Forward Bias Safe Operating Area

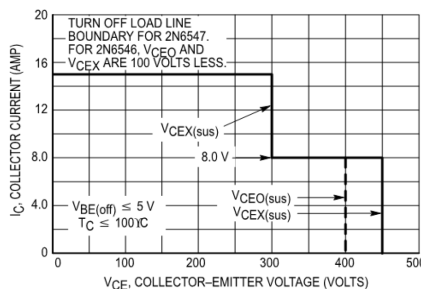


Figure 8. Reverse Bias Safe Operating Area

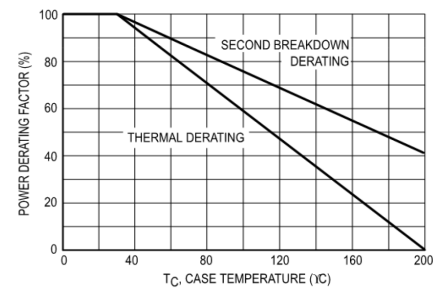


Figure 9. Power Derating

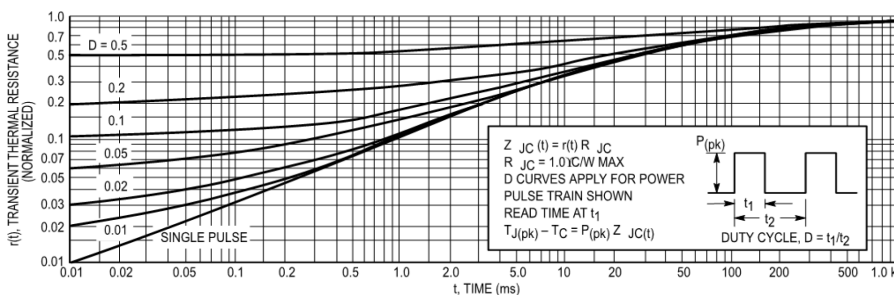
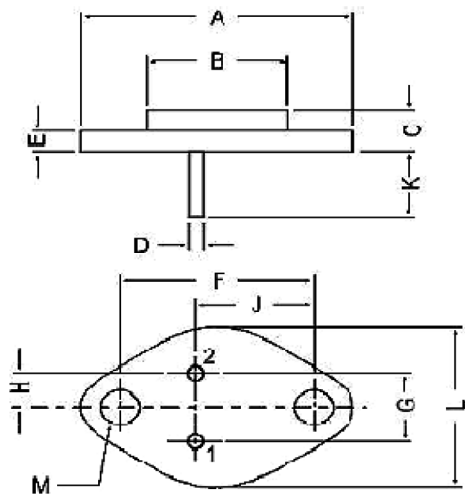


Figure 10. Thermal Response

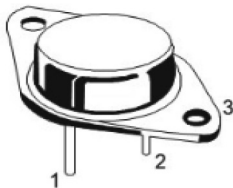
Package Details



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

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