Transistor, NPN
TO-3

Description:

The 2N6547 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 220V line operated switch-mode applications.

Features:

- High temperature performance specified for:
  - Reversed biased SOA with inductive loads.
  - Switching time with inductive loads.
  - Saturation voltages.
  - Leakage currents.

Applications:

Switching regulators.
PWM inverters and motor controls.
Solenoid and relay drivers.
Deflection circuits.

Maximum Ratings

Rating	Symbol	Value	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	I_C I_{CM}	15 30	A DC
Base Current - Continuous - Peak	I_B I_{BM}	10 20	
Emitter Current - Continuous - Peak	I_E I_{EM}	25 35	
Total Power Dissipation at T_C = 25°C at T_C = 100°C Derate above 25°C	P_D	 175 100 1	 W W/°C
Operating and Storage Junction Temperature Range	T_J T_{stg}	-65 to +200	°C

Thermal Characteristics

Characteristics	Symbol	Max.	Unit
Thermal Resistance Junction to Case	$R_{\theta JC}$	1	°C/W
Max. Lead Temperature for Soldering Purposes 1/8" from Case for 5 Seconds	T_L	275	°C

multicomp

Electrical Characteristics (TC = 25°C unless otherwise noted)

Characteristic	Symbol	Min.	Max.	Unit
Off Characteristics (1)				
Collector-Emitter Sustaining Voltage (I_C = 100mA, I_B = 0)	$V_{EO\ (sus)}$	400	-	V DC
Collector-Emitter Sustaining Voltage (I_C = 8A, V_{clamp} = Rated V_{CEX}, T_C = 100°C) (I_C = 15A, V_{clamp} = Rated V_{CEO} = 100V, T_C = 100°C)	$V_{CEX\ (sus)}$	450 300	-	
Collector Cut off Current (V_{CEV} = Rated Value, $V_{BE\ (off)}$ = 1.5V DC) (V_{CEV} = Rated Value, $V_{BE\ (off)}$ = 1.5V DC, T_C = 100°C)	I_{CEV}	-	1 4	mA DC
Collector Cut off Current (V_{CE} = Rated V_{CEV}, R_{BE} = 50Ω, T_C = 100°C)	I_{CER}	-	5	
Emitter Cut off Current (V_{EB} = 9V DC, I_C = 0)	I_{ERO}	-	1	
Second Breakdown				
Second Breakdown Collector Current with Base Forward Biased t = 1s (Non-repetitive) (V_{CE} = 100V DC)	$I_{S/b}$	0.2	-	A DC
On Characteristic (1)				
DC Current Gain (I_C = 5A DC, V_{CE} = 2V DC) (I_C = 10A DC, V_{CE} = 2V DC)	h_{FE}	12 6	60 30	-
Collector-Emitter Saturation Voltage (I_C = 10A DC, I_B = 2A DC) (I_C = 15A DC, I_B = 3A DC) (I_C = 10A DC, I_B = 2A DC, T_C = 100°C)	$V_{CE\ (sat)}$	-	1.5 5 2.5	V DC
Base-Emitter Saturation Voltage (I_C = 10A DC, I_B = 2A DC) (I_C = 10A DC, I_B = 2A DC, T_C = 100°C	$V_{BE\ (sat)}$	-	1.6	
Dynamic Characteristics				
Current-Gain-Bandwidth Product (I_C = 500mA DC, V_{CE} = 10V DC, f_{test} = 1MHz)	f_T	6	28	MHz
Output Capacitance (V_{CB} = 10V DC, I_E = 0, f_{test} = 1MHz)	C_{ob}	125	500	pF

Indicates JEDEC Registered Data.
(1) Pulse Test: Pulse Width = 300μs, Duty Cycle = 2%.

Transistor, NPN
TO-3

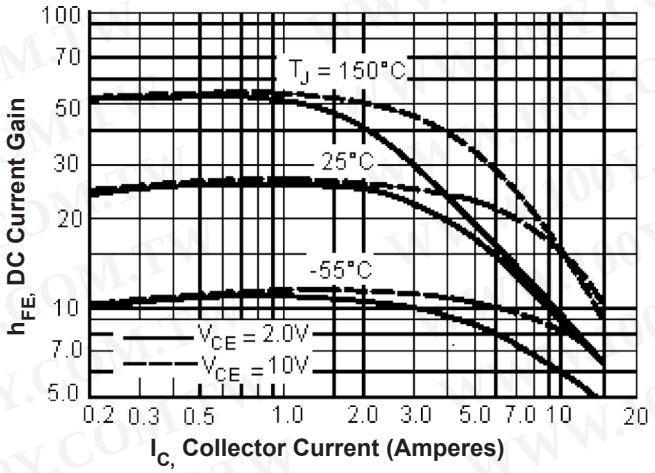
multicomp

Switching Characteristics

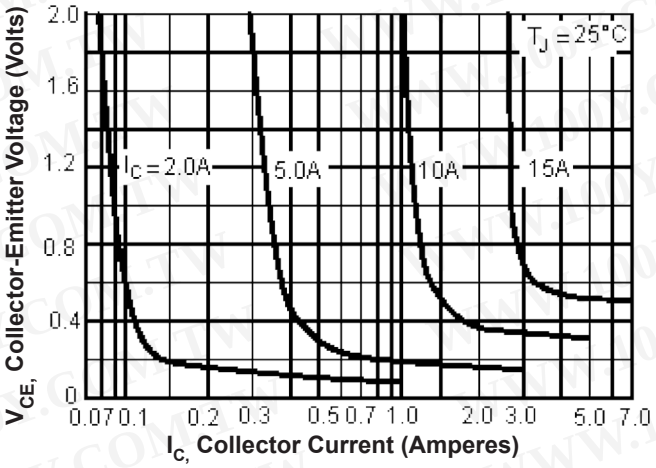
Resistive Load					
Delay Time	(V_{CC} = 250V, I_C = 10A, I_{B1} = I_{B2} = 2A, t_p = 100µS, Duty Cycle ≤2%)	t_d	-	0.05	µs
Rise Time		t_r	-	1	
Storage Time		t_s	-	4	
Fall Time		t_f	-	0.7	
Inductive Load, Clamped					
Storage Time	(I_C = 10A (pk), V_{clamp} = Rated V_{CEX}, I_{B1} = 2A, $V_{BE\ (off)}$ = 5V DC, T_C = 100°C)	t_s	-	5	µs
Fall Time		t_f	-	1.5	
Storage Time	(I_C = 10A (pk), V_{clamp} = Rated V_{CEX}, I_{B1} = 2A, $V_{BE\ (off)}$ = 5V DC, T_C = 25°C)	t_s	Typical 2		µs
Fall Time		t_f	Typical 0.09		

Typical Electrical Characteristics

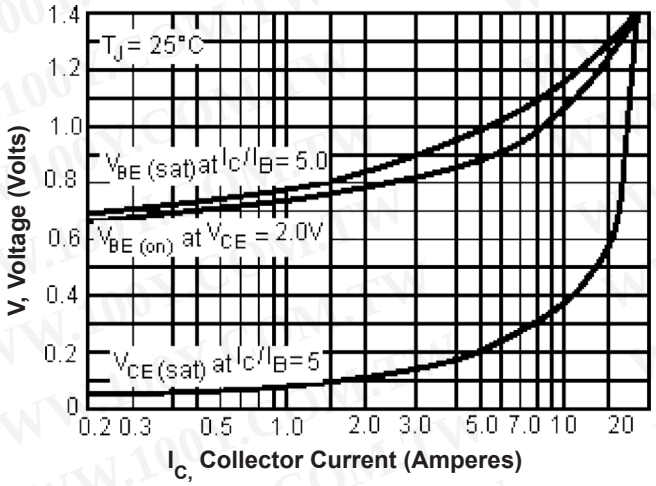
DC Current Gain



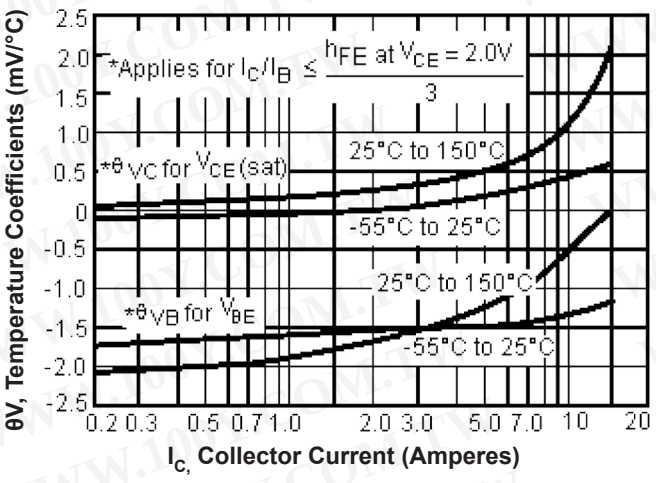
Collector Saturation Region



"On" Voltages



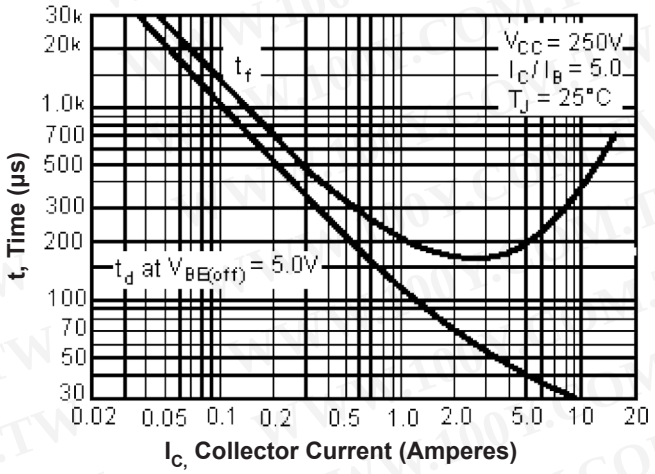
Temperature Coefficients



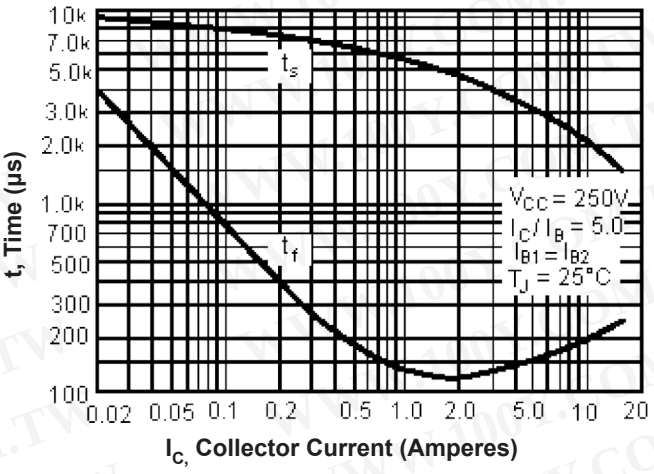
Transistor, NPN
TO-3

multicomp

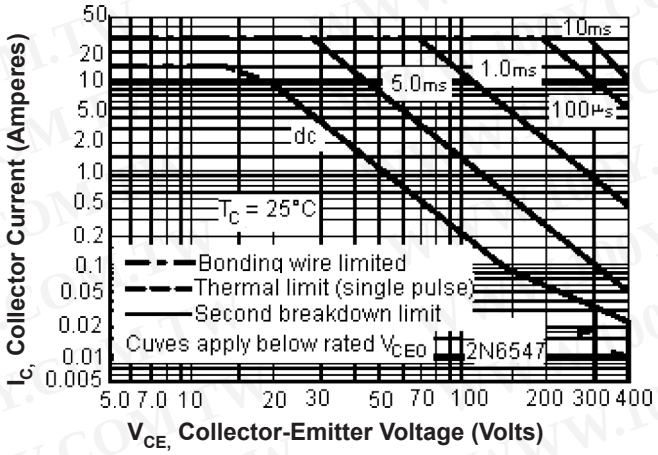
Turn-On Time



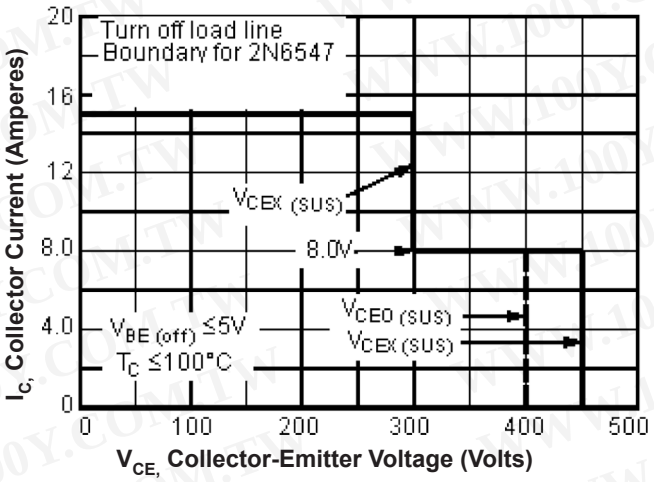
Turn-Off Time



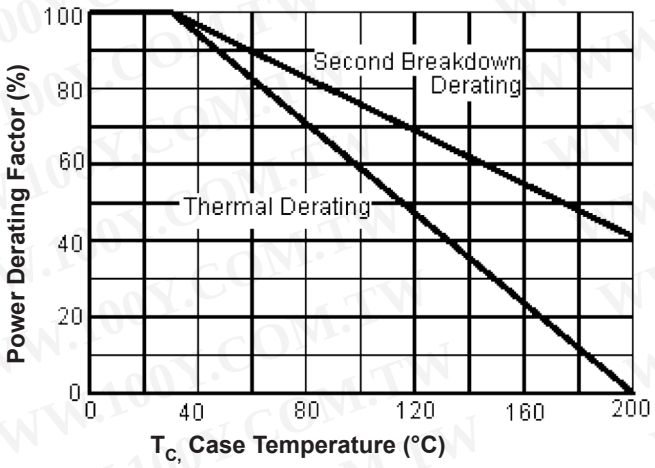
Forward Bias Safe Operating Area



Reverse Bias Safe Operating Area



Power Derating

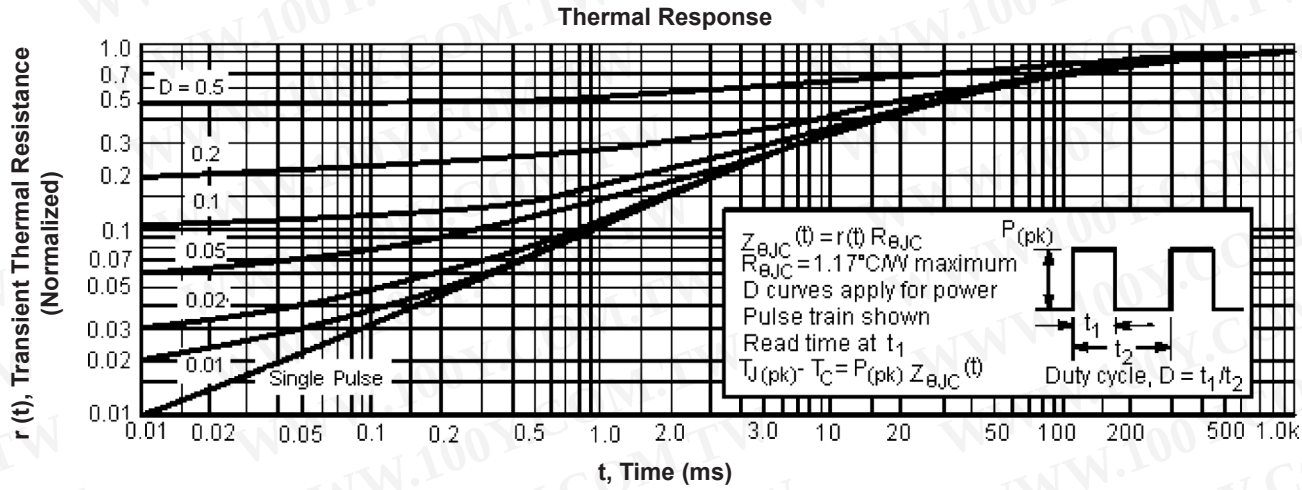


There are two limitations on the power handling ability of a transistor: average junction temperature and second breakdown. Safe operating area curves indicate $I_C - V_{CE}$ limits of the transistor that must be observed for reliable operation; i.e., the transistor must not be subjected to greater dissipation than the curves indicate.

The data is based on T_C = 25°C; $T_{J(pk)}$ is variable depending on power level. Second breakdown pulse limits are valid for duty cycles to 10% but must be derated when T_C ≥25°C. Second breakdown limitations do not derate the same as thermal limitations. Allowable current at the voltages shown may be found at any case temperature by using the appropriate curve.$T_{J(pk)}$ may be calculated from the data. At high case temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by second breakdown.

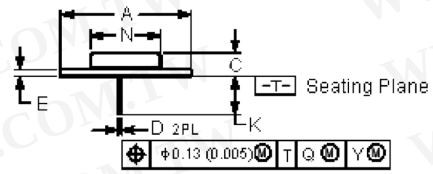
Transistor, NPN
TO-3

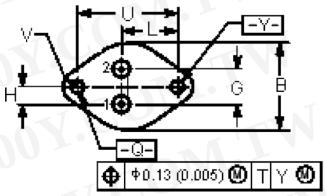
multicomp

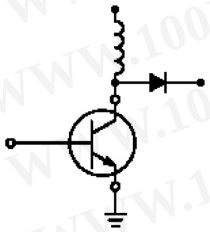


Dimensions

TO-204 (TO-3)







Dim.	Min.	Max.
A	1.55 (39.37) Reference	
B	-	1.05 (26.67)
C	0.25 (6.35)	0.335 (8.51)
D	0.038 (0.97)	0.043 (1.09)
E	0.055 (1.4)	0.07 (1.77)
G	0.43 (10.92) BSC	
H	0.215 (5.46) BSC	
K	0.44 (11.18)	0.48 (12.19)
L	0.665 (16.89) BSC	
N	-	0.83 (21.08)
Q	0.151 (3.84)	0.165 (4.19)
U	1.187 (30.15) BSC	
V	0.131 (3.33)	0.188 (4.77)

Dimensions : Inches (Millimetres)

Pin Configuration

Pin 1. Base
2. Emitter
Collector (Case)

Part Number Table

Description	Part Number
Transistor, NPN, TO-3	2N6547