



Continental Device India Pvt. Limited

An IATF 16949, ISO9001 and ISO 14001 Certified Company



## Switchmode Serier NPN Silicon Power Transistor

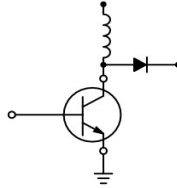
15 AMPERES, 300 and 400 VOLTS,175 WATTS

**2N6546**

**2N6547**



TO-3



**TO-3**

**Metal Can Package**

**RoHS compliant**

### FEATURES:

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 220 volt line operated switch-mode applications

Specification Features —

High Temperature Performance Specified for:

Reversed Biased SOA with Inductive Loads

Switching Times with Inductive Loads

Saturation Voltages

Leakage Currents

### APPLICATIONS:

1. Switching Regulators
2. PWM Inverters and Motor Controls
3. Solenoid and Relay Drivers
4. Deflection Circuits

2N6547

Rev0\_30042020EM



Continental Device India Pvt. Limited

An IATF 16949, ISO9001 and ISO 14001 Certified Company



**ABSOLUTE MAXIMUM RATINGS** ( $T_a = 25\text{ }^\circ\text{C}$ )

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	$V_{CEO(sus)}$	400	Vdc
Collector–Emitter Voltage	$V_{CEX(sus)}$	450	Vdc
Collector–Emitter Voltage	$V_{CEV}$	850	Vdc
Emitter Base Voltage	$V_{EB}$	9.0	Vdc
Collector Current — Continuous	$I_C$	15	Adc
— Peak (2)	$I_{CM}$	30	
Base Current — Continuous	$I_B$	10	Adc
— Peak (2)	$I_{BM}$	20	
Emitter Current — Continuous	$I_E$	25	Adc
— Peak (2)	$I_{EM}$	35	
Total Power Dissipation	$P_D$		Watts
@ $T_C = 25\text{ }^\circ\text{C}$		175	
@ $T_C = 100\text{ }^\circ\text{C}$		100	
Derate above $25\text{ }^\circ\text{C}$		1.0	W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-65 to +200	$^\circ\text{C}$

**THERMAL CHARACTERISTICS**

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{JC}$	1.0	$^\circ\text{C/W}$
Maximum Lead Temperature for Soldering Purposes: 1/8 from Case for 5 Seconds	$T_L$	275	$^\circ\text{C}$

2N6547  
Rev0\_30042020EM



Continental Device India Pvt. Limited

An IATF 16949, ISO9001 and ISO 14001 Certified Company



**ELECTRICAL CHARACTERISTICS** ( $T_A=25^\circ\text{C}$  unless otherwise specified)

Characteristic	Symbol	Min	Max	Unit
<b>OFF CHARACTERISTICS (1)</b>				
Collector–Emitter Sustaining Voltage ( $I_C = 100\text{ mA}$ , $I_B = 0$ )	2N6546 2N6547	$V_{CEO(sus)}$ 300 400	— —	Vdc
Collector–Emitter Sustaining Voltage ( $I_C = 8.0\text{ A}$ , $V_{clamp} = \text{Rated } V_{CEX}$ , $T_C = 100^\circ\text{C}$ )  ( $I_C = 15\text{ A}$ , $V_{clamp} = \text{Rated } V_{CEO} = 100\text{ V}$ , $T_C = 100^\circ\text{C}$ )	2N6546 2N6547 2N6546 2N6547	$V_{CEX(sus)}$ 350 450 200 300	— — — —	Vdc
Collector Cutoff Current ( $V_{CEV} = \text{Rated Value}$ , $V_{BE(off)} = 1.5\text{ Vdc}$ ) ( $V_{CEV} = \text{Rated Value}$ , $V_{BE(off)} = 1.5\text{ Vdc}$ , $T_C = 100^\circ\text{C}$ )		$I_{CEV}$	— —	1.0 4.0 mAdc
Collector Cutoff Current ( $V_{CE} = \text{Rated } V_{CEV}$ , $R_{BE} = 50\ \Omega$ , $T_C = 100^\circ\text{C}$ )		$I_{CER}$	—	5.0 mAdc
Emitter Cutoff Current ( $V_{EB} = 9.0\text{ Vdc}$ , $I_C = 0$ )		$I_{EBO}$	—	1.0 mAdc
<b>SECOND BREAKDOWN</b>				
Second Breakdown Collector Current with base forward biased $t = 1.0\text{ s}$ (non–repetitive) ( $V_{CE} = 100\text{ Vdc}$ )		$I_{S/b}$	0.2	— Adc
<b>ON CHARACTERISTICS (1)</b>				
DC Current Gain ( $I_C = 5.0\text{ Adc}$ , $V_{CE} = 2.0\text{ Vdc}$ ) ( $I_C = 10\text{ Adc}$ , $V_{CE} = 2.0\text{ Vdc}$ )		$h_{FE}$	12 6.0	60 30 —
Collector–Emitter Saturation Voltage ( $I_C = 10\text{ Adc}$ , $I_B = 2.0\text{ Adc}$ ) ( $I_C = 15\text{ Adc}$ , $I_B = 3.0\text{ Adc}$ ) ( $I_C = 10\text{ Adc}$ , $I_B = 2.0\text{ Adc}$ , $T_C = 100^\circ\text{C}$ )		$V_{CE(sat)}$	— — —	1.5 5.0 2.5 Vdc
Base–Emitter Saturation Voltage ( $I_C = 10\text{ Adc}$ , $I_B = 2.0\text{ Adc}$ ) ( $I_C = 10\text{ Adc}$ , $I_B = 2.0\text{ Adc}$ , $T_C = 100^\circ\text{C}$ )		$V_{BE(sat)}$	— —	1.6 1.6 Vdc
<b>DYNAMIC CHARACTERISTICS</b>				
Current–Gain — Bandwidth Product ( $I_C = 500\text{ mAdc}$ , $V_{CE} = 10\text{ Vdc}$ , $f_{test} = 1.0\text{ MHz}$ )		$f_T$	6.0	28 MHz
Output Capacitance ( $V_{CB} = 10\text{ Vdc}$ , $I_E = 0$ , $f_{test} = 1.0\text{ MHz}$ )		$C_{ob}$	125	500 pF
<b>SWITCHING CHARACTERISTICS</b>				
Resistive Load				
Delay Time	$(V_{CC} = 250\text{ V}$ , $I_C = 10\text{ A}$ , $I_{B1} = I_{B2} = 2.0\text{ A}$ , $t_p = 100\ \mu\text{s}$ , Duty Cycle $\leq 2.0\%$ )	$t_d$	—	0.05 s
Rise Time		$t_r$	—	1.0 s
Storage Time		$t_s$	—	4.0 s
Fall Time		$t_f$	—	0.7 s
Inductive Load, Clamped				
Storage Time	$(I_C = 10\text{ A(pk)}$ , $V_{clamp} = \text{Rated } V_{CEX}$ , $I_{B1} = 2.0\text{ A}$ , $V_{BE(off)} = 5.0\text{ Vdc}$ , $T_C = 100^\circ\text{C}$ )	$t_s$	—	5.0 s
Fall Time		$t_f$	—	1.5 s
<b>Typical</b>				
Storage Time	$(I_C = 10\text{ A(pk)}$ , $V_{clamp} = \text{Rated } V_{CEX}$ , $I_{B1} = 2.0\text{ A}$ , $V_{BE(off)} = 5.0\text{ Vdc}$ , $T_C = 25^\circ\text{C}$ )	$t_s$	—	2.0 s
Fall Time		$t_f$	—	0.09 s

(1) Pulse Test: Pulse Width = 300  $\mu\text{s}$ , Duty Cycle = 2%.

2N6547  
Rev0\_30042020EM



Continental Device India Pvt. Limited

An IATF 16949, ISO9001 and ISO 14001 Certified Company



### TYPICAL CHARACTERISTICS CURVES

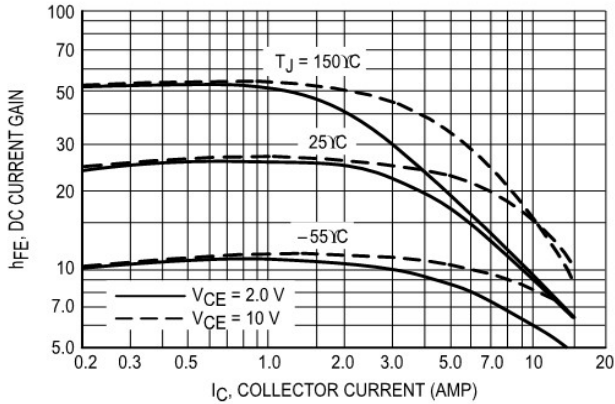


Figure 1. DC Current Gain

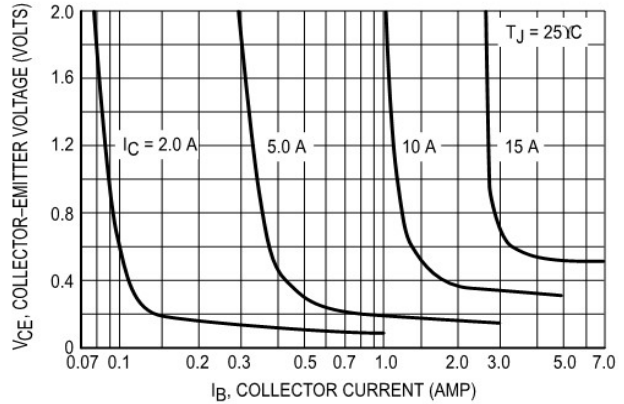


Figure 2. Collector Saturation Region

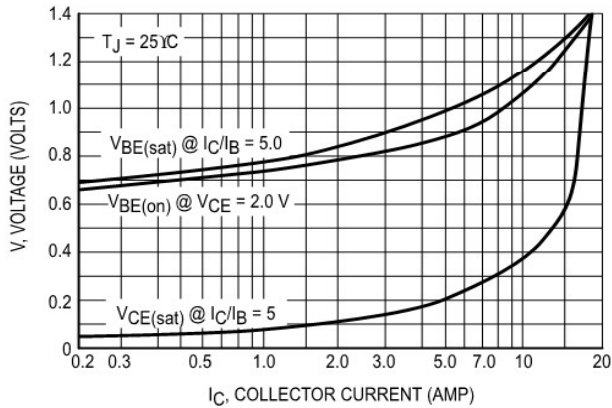


Figure 3. "On" Voltages

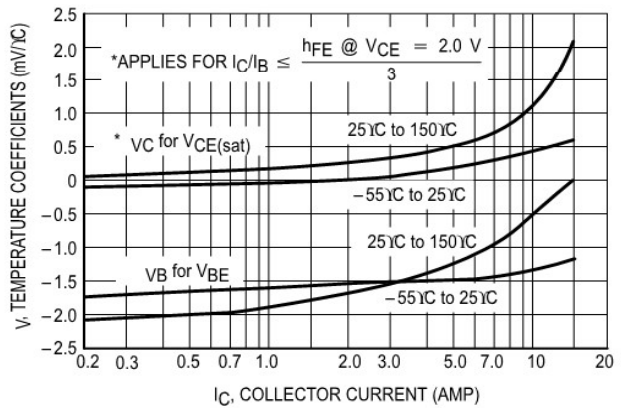


Figure 4. Temperature Coefficients

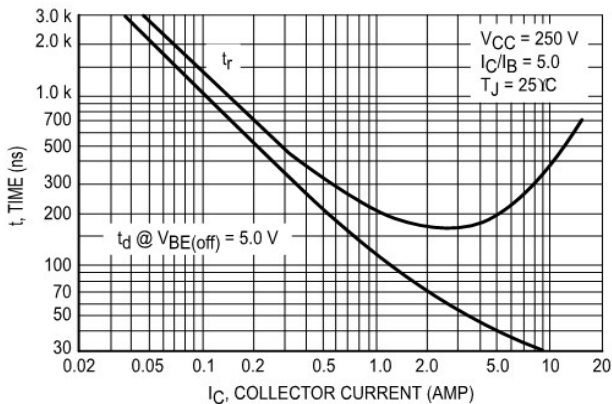


Figure 5. Turn-On Time

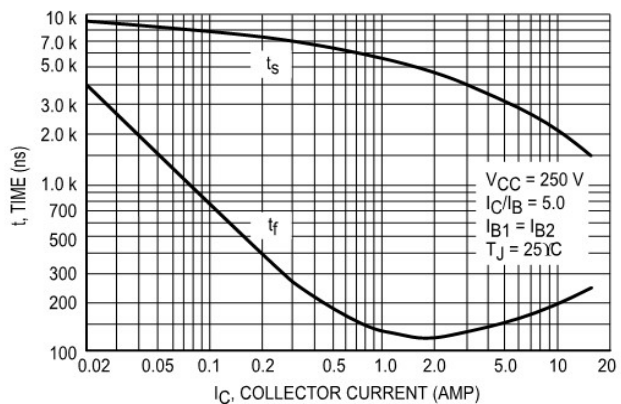


Figure 6. Turn-Off Time

2N6547  
Rev0\_30042020EM

### TYPICAL CHARACTERISTICS CURVES

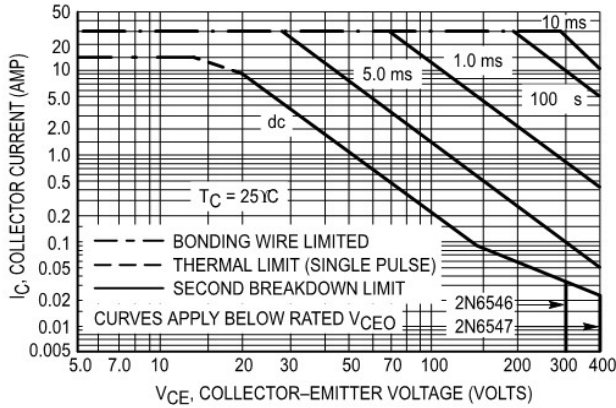


Figure 7. Forward Bias Safe Operating Area

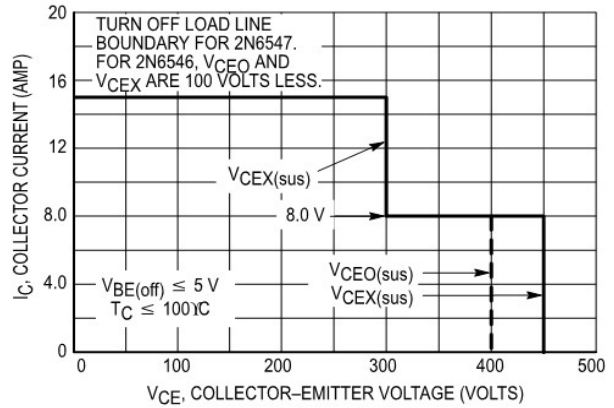


Figure 8. Reverse Bias Safe Operating Area

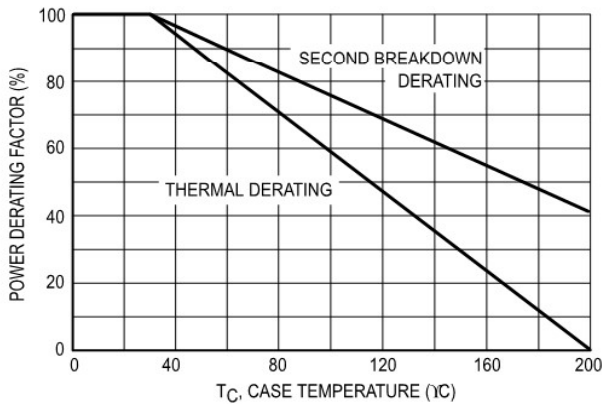


Figure 9. Power Derating

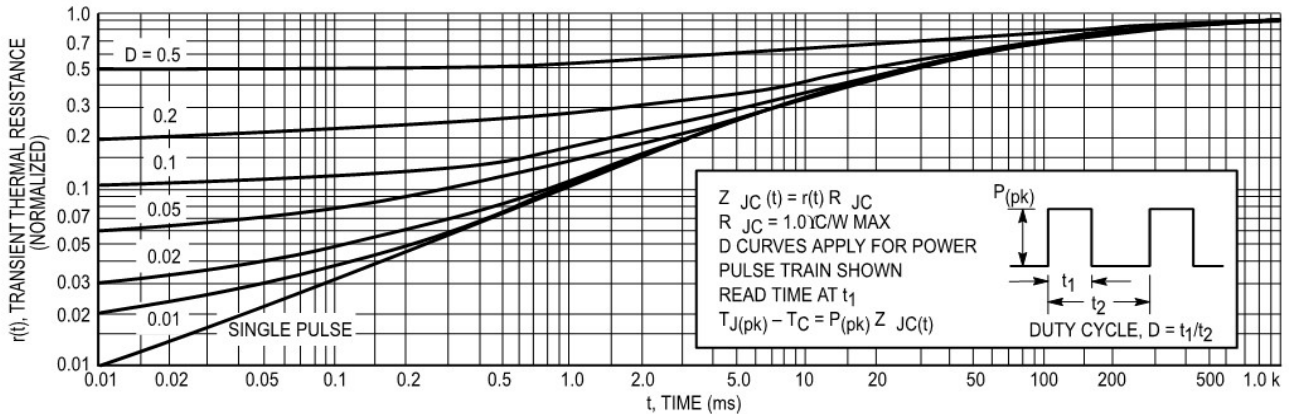
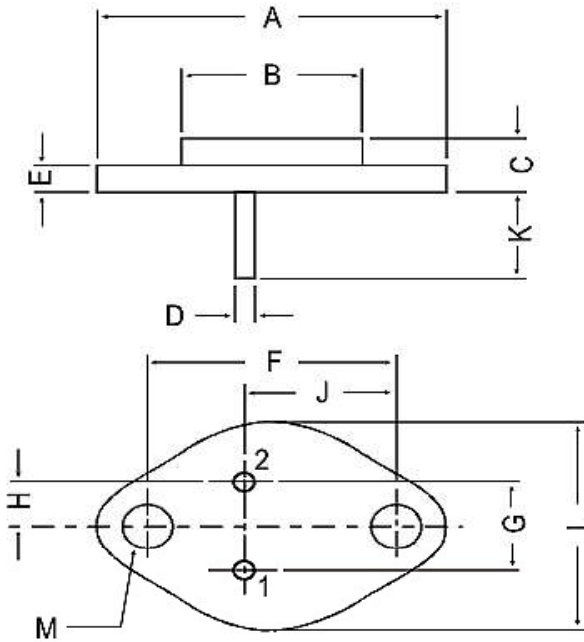


Figure 10. Thermal Response

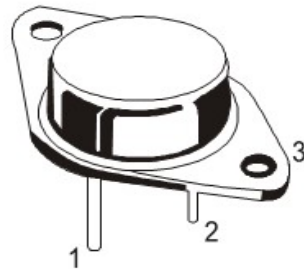


### Package Details



All dimensions in mm.

DIM	MIN.	MAX.
A	—	39.37
B	—	22.22
C	6.35	8.50
D	0.96	1.09
E	—	1.77
F	29.90	30.40
G	10.69	11.18
H	5.20	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

### Packing Detail

PACKAGE	STANDARD PACK		INNER CARTON BOX		OUTER CARTON BOX		
	Details	Net Weight/Qty	Size	Qty	Size	Qty	Gr Wt
TO-3	100 pcs/pkt	1.3 kg/100 pcs	12.5" x 8" x 1.8"	0.1K	17" x 11.5" x 21"	2K	27.5 kgs



Continental Device India Pvt. Limited

An IATF 16949, ISO9001 and ISO 14001 Certified Company



## Recommended Product Storage Environment for Discrete Semiconductor Devices

This storage environment assumes that the Diodes and transistors are packed properly inside the original packing supplied by CDIL.

- Temperature 5 °C to 30 °C
- Humidity between 40 to 70 %RH
- Air should be clean.
- Avoid harmful gas or dust.
- Avoid outdoor exposure or storage in areas subject to rain or water spraying .
- Avoid storage in areas subject to corrosive gas or dust. Product shall not be stored in areas exposed to direct sunlight.
- Avoid rapid change of temperature.
- Avoid condensation.
- Mechanical stress such as vibration and impact shall be avoided.
- The product shall not be placed directly on the floor.
- The product shall be stored on a plane area. They should not be turned upside down. They should not be placed against the wall.

### Shelf Life of CDIL Products

The shelf life of products is the period from product manufacture to shipment to customers. The product can be unconditionally shipped within this period. The period is defined as 2 years.

If products are stored longer than the shelf life of 2 years the products shall be subjected to quality check as per CDIL quality procedure.

The products are further warranted for another one year after the date of shipment subject to the above conditions in CDIL original packing.

### Floor Life of CDIL Products and MSL Level

When the products are opened from the original packing, the floor life will start.

For this, the following JEDEC table may be referred:

JEDEC MSL Level		
Level	Time	Condition
1	Unlimited	≤30 °C / 85% RH
2	1 Year	≤30 °C / 60% RH
2a	4 Weeks	≤30 °C / 60% RH
3	168 Hours	≤30 °C / 60% RH
4	72 Hours	≤30 °C / 60% RH
5	48 Hours	≤30 °C / 60% RH
5a	24 Hours	≤30 °C / 60% RH
6	Time on Label(TOL)	≤30 °C / 60% RH

2N6547

Rev0\_30042020EM



Continental Device India Pvt. Limited

An IATF 16949, ISO9001 and ISO 14001 Certified Company



## Customer Notes

### Component Disposal Instructions

1. CDIL Semiconductor Devices are RoHS compliant, customers are requested to please dispose as per prevailing Environmental Legislation of their Country.
2. In Europe, please dispose as per EU Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE).

### Disclaimer

The product information and the selection guides facilitate selection of the CDIL's Semiconductor Device(s) best suited for application in your product(s) as per your requirement. It is recommended that you completely review our Data Sheet(s) so as to confirm that the Device(s) meet functionality parameters for your application. The information furnished in the Data Sheet and on the CDIL Web Site/CD are believed to be accurate and reliable. CDIL however, does not assume responsibility for inaccuracies or incomplete information.

Furthermore, CDIL does not assume liability whatsoever, arising out of the application or use of any CDIL product; neither does it convey any license under its patent rights nor rights of others. These products are not designed for use in life saving/support appliances or systems. CDIL customers selling these products (either as individual Semiconductor Devices or incorporated in their end products), in any life saving/support appliances or systems or applications do so at their own risk and CDIL will not be responsible for any damages resulting from such sale(s).

CDIL strives for continuous improvement and reserves the right to change the specifications of its products without prior notice.



CDIL is a registered trademark of

**Continental Device India Pvt. Limited**

C-120 Naraina Industrial Area, New Delhi 110 028, India.

Telephone +91-11-2579 6150, 4141 1112 Fax +91-11-2579 5290, 4141 1119

email@cdil.com www.cdil.com

CIN No. U32109DL1964PTC004291

2N6547

Rev0\_30042020EM