

# 2N6387, 2N6388

## Plastic Medium-Power Silicon Transistors

These devices are designed for general-purpose amplifier and low-speed switching applications.

### Features

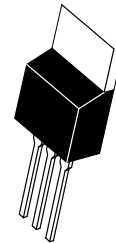
- High DC Current Gain –  $h_{FE} = 2500$  (Typ) @  $I_C = 4.0$  Adc
- Collector–Emitter Sustaining Voltage – @ 100 mAdc  
 $V_{CE(sus)} = 60$  Vdc (Min) – 2N6387  
 $= 80$  Vdc (Min) – 2N6388
- Low Collector–Emitter Saturation Voltage –  
 $V_{CE(sat)} = 2.0$  Vdc (Max) @  $I_C$   
 $= 5.0$  Adc – 2N6387, 2N6388
- Monolithic Construction with Built–In Base–Emitter Shunt Resistors
- TO–220AB Compact Package
- These Devices are Pb–Free and are RoHS Compliant\*

### MAXIMUM RATINGS (Note 1)

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	$V_{CEO}$	60 80	Vdc
Collector–Base Voltage	$V_{CB}$	60 80	Vdc
Emitter–Base Voltage	$V_{EB}$	5.0	Vdc
Collector Current – Continuous – Peak	$I_C$	10 15	Adc
Base Current	$I_B$	250	mAdc
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	65 0.52	

assumed, damage may occur and reliability may be affected.  
1. Indicates JEDEC Registered Data.

## DARLINGTON NPN SILICON POWER TRANSISTORS 8 AND 10 AMPERES 65 WATTS, 60 – 80 VOLTS



TO–220  
CASE 221A  
STYLE 1

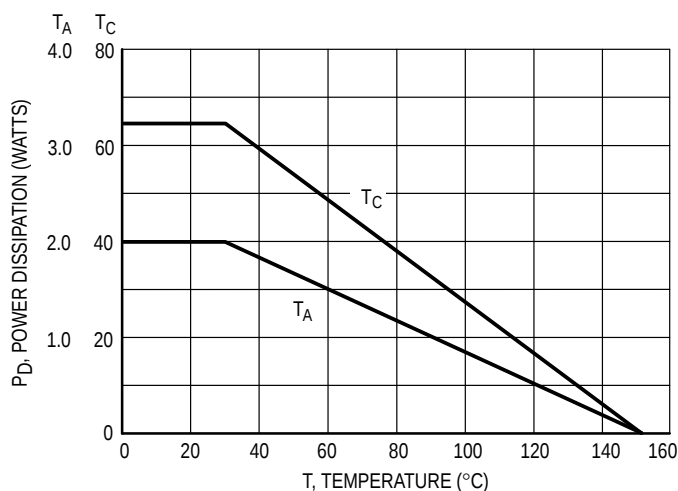
2N638x = Device Code

### THERMAL CHARACTERISTICS

Characteristics	Symbol	Max	Unit
Thermal Resistance, Junction–to–Case	$R_{\theta JC}$	1.92	$^\circ\text{C/W}$
Thermal Resistance, Junction–to–Ambient	$R_{\theta JA}$	62.5	$^\circ\text{C/W}$

\*For additional information on our Pb–Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

## 2N6387, 2N6388



**Figure 1. Power Derating**

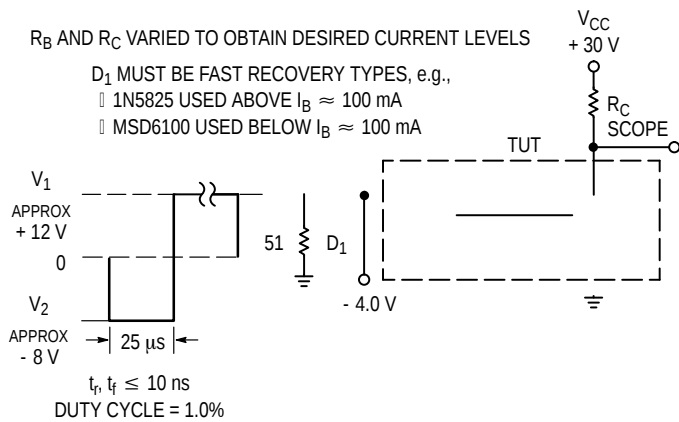
### ELECTRICAL CHARACTERISTICS ( $T_C = 25^\circ\text{C}$ unless otherwise noted) (Note 2)

Characteristic	Symbol	Min	Max	Unit
<b>OFF CHARACTERISTICS</b>				
Collector-Emitter Sustaining Voltage (Note 3) ( $I_C = 200\text{ mA dc}$ , $I_B = 0$ )	2N6387 2N6388	$V_{CE(sus)}$	60 80	– – Vdc
Collector Cutoff Current ( $V_{CE} = 60\text{ Vdc}$ , $I_B = 0$ ) ( $V_{CE} = 80\text{ Vdc}$ , $I_B = 0$ )	2N6387 2N6388	$I_{CEO}$	– –	1.0 1.0 mA dc
Collector Cutoff Current ( $V_{CE} = 60\text{ Vdc}$ , $V_{EB(off)} = 1.5\text{ Vdc}$ ) ( $V_{CE} = 80\text{ Vdc}$ , $V_{EB(off)} = 1.5\text{ Vdc}$ ) ( $V_{CE} = 60\text{ Vdc}$ , $V_{EB(off)} = 1.5\text{ Vdc}$ , $T_C = 125^\circ\text{C}$ ) ( $V_{CE} = 80\text{ Vdc}$ , $V_{EB(off)} = 1.5\text{ Vdc}$ , $T_C = 125^\circ\text{C}$ )	2N6387 2N6388 2N6387 2N6388	$I_{CEX}$	– – – –	300 300 3.0 3.0 $\mu\text{A dc}$ mA dc
Emitter Cutoff Current ( $V_{BE} = 5.0\text{ Vdc}$ , $I_C = 0$ )		$I_{EBO}$	–	5.0 mA dc
<b>ON CHARACTERISTICS (Note 3)</b>				
DC Current Gain ( $I_C = 5.0\text{ Adc}$ , $V_{CE} = 3.0\text{ Vdc}$ ) ( $I_C = 10\text{ Adc}$ , $V_{CE} = 3.0\text{ Vdc}$ )	2N6387, 2N6388 2N6387, 2N6388	$h_{FE}$	1000 100	20,000 – –
Collector-Emitter Saturation Voltage ( $I_C = 5.0\text{ Adc}$ , $I_B = 0.01\text{ Adc}$ ) ( $I_C = 10\text{ Adc}$ , $I_B = 0.1\text{ Adc}$ )	2N6387, 2N6388 2N6387, 2N6388	$V_{CE(sat)}$	– –	2.0 3.0 Vdc
Base-Emitter On Voltage ( $I_C = 5.0\text{ Adc}$ , $V_{CE} = 3.0\text{ Vdc}$ ) ( $I_C = 10\text{ Adc}$ , $V_{CE} = 3.0\text{ Vdc}$ )	2N6387, 2N6388 2N6387, 2N6388	$V_{BE(on)}$	– –	2.8 4.5 Vdc

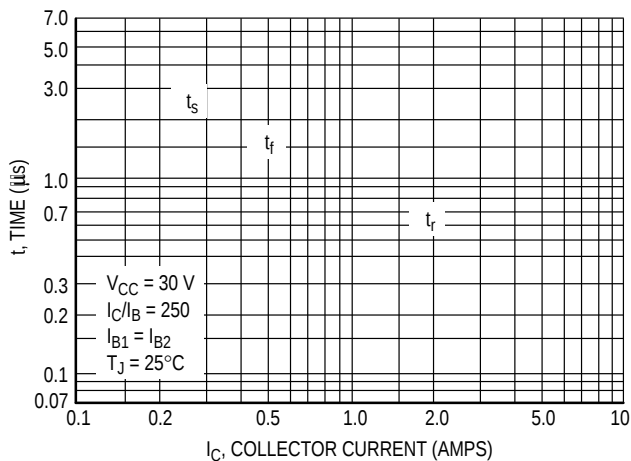
### DYNAMIC CHARACTERISTICS

Small-Signal Current Gain ( $I_C = 1.0\text{ Adc}$ ,  $V_{CE} = 5.0\text{ Vdc}$ ,  $f_{test} = 1.0\text{ MHz}$ )

# 2N6387, 2N6388



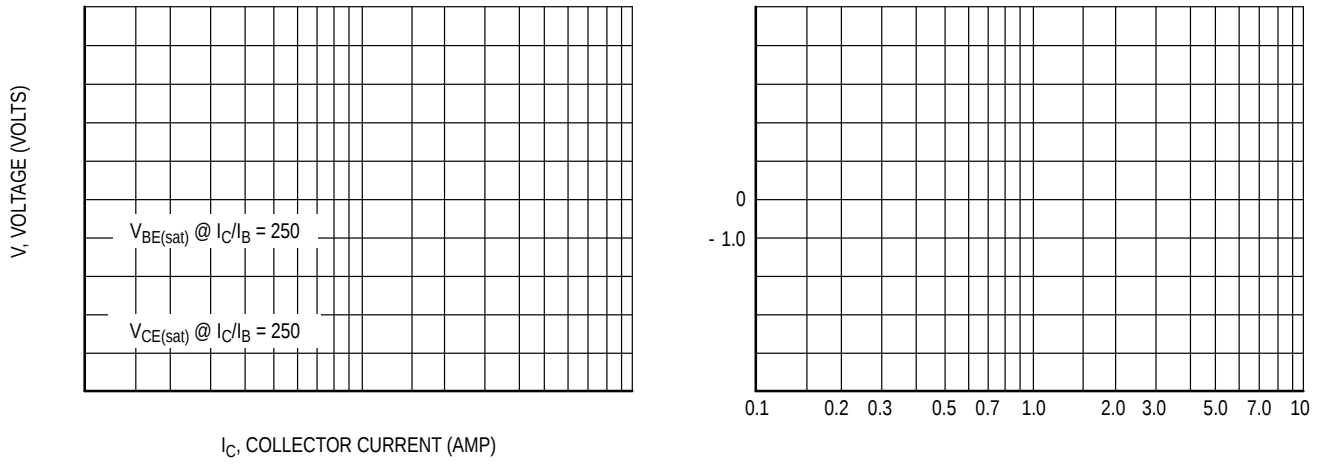
**Figure 2. Switching Times Test Circuit**



**Figure 3. Switching Times**



# 2N6387, 2N6388



**Figure 10. "On" Voltages**

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