

## TIP47, TIP48, TIP50

# High Voltage NPN Silicon Power Transistors

This series is designed for line operated audio output amplifier, SWITCHMODE power supply drivers and other switching applications.

### Features

- Popular TO-220 Plastic Package
- These Devices are Pb-Free and are RoHS Compliant\*
- Complementary to the MJE5730 and MJE5731 Series

### MAXIMUM RATINGS

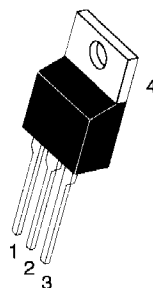
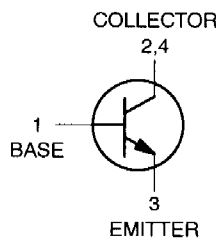
Rating	Symbol	TIP47	TIP48	TIP50	Unit
Collector - Emitter Voltage	$V_{CEO}$	250	300	400	Vdc
Collector - Base Voltage	$V_{CB}$	350	400	500	Vdc
Emitter - Base Voltage	$V_{EB}$	5.0			Vdc
Collector Current - Continuous	$I_C$	1.0			Adc
Collector Current - Peak	$I_{CM}$	2.0			Adc
Base Current	$I_B$	0.6			Adc
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	40 0.32			W W/ $^\circ\text{C}$
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	2.0 0.016			W W/ $^\circ\text{C}$
Unclamped Inducting Load Energy (See Figure 8)	E	20			mJ
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-65 to +150			$^\circ\text{C}$

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

### THERMAL CHARACTERISTICS

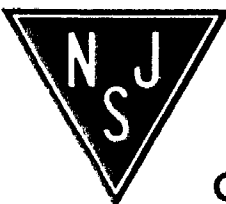
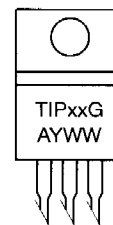
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	3.125	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62.5	$^\circ\text{C/W}$

**1.0 AMPERE  
POWER TRANSISTORS  
NPN SILICON  
250-300-400 VOLTS  
40 WATTS**



TO-220AB

### MARKING DIAGRAM



NJ Semi-Conductors reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by NJ Semi-Conductors is believed to be both accurate and reliable at the time of going to press. However, NJ Semi-Conductors assumes no responsibility for any errors or omissions discovered in its use. NJ Semi-Conductors encourages customers to verify that datasheets are current before placing orders.

**Quality Semi-Conductors**

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

Characteristic	Symbol	Min	Max	Unit
<b>OFF CHARACTERISTICS</b>				
Collector–Emitter Sustaining Voltage (Note 1) ( $I_C = 30\text{ mAdc}$ , $I_B = 0$ )	TIP47 TIP48 TIP50	$V_{CEO(sus)}$	250 300 400	– – – Vdc
Collector Cutoff Current ( $V_{CE} = 150\text{ Vdc}$ , $I_B = 0$ ) ( $V_{CE} = 200\text{ Vdc}$ , $I_B = 0$ ) ( $V_{CE} = 300\text{ Vdc}$ , $I_B = 0$ )	TIP47 TIP48 TIP50	$I_{CEO}$	– – –	1.0 1.0 1.0 mAdc
Collector Cutoff Current ( $V_{CE} = 350\text{ Vdc}$ , $V_{BE} = 0$ ) ( $V_{CE} = 400\text{ Vdc}$ , $V_{BE} = 0$ ) ( $V_{CE} = 500\text{ Vdc}$ , $V_{BE} = 0$ )	TIP47 TIP48 TIP50	$I_{CES}$	– – –	1.0 1.0 1.0 mAdc
Emitter Cutoff Current ( $V_{BE} = 5.0\text{ Vdc}$ , $I_C = 0$ )		$I_{EBO}$	–	1.0 mAdc
<b>ON CHARACTERISTICS</b> (Note 1)				
DC Current Gain ( $I_C = 0.3\text{ Adc}$ , $V_{CE} = 10\text{ Vdc}$ ) ( $I_C = 1.0\text{ Adc}$ , $V_{CE} = 10\text{ Vdc}$ )		$h_{FE}$	30 10	150 – –
Collector–Emitter Saturation Voltage ( $I_C = 1.0\text{ Adc}$ , $I_B = 0.2\text{ Adc}$ )		$V_{CE(sat)}$	–	1.0 Vdc
Base–Emitter On Voltage ( $I_C = 1.0\text{ Adc}$ , $V_{CE} = 10\text{ Vdc}$ )		$V_{BE(on)}$	–	1.5 Vdc
<b>DYNAMIC CHARACTERISTICS</b>				
Current–Gain – Bandwidth Product ( $I_C = 0.1\text{ Adc}$ , $V_{CE} = 10\text{ Vdc}$ , $f = 2.0\text{ MHz}$ )		$f_T$	10	– MHz
Small–Signal Current Gain ( $I_C = 0.2\text{ Adc}$ , $V_{CE} = 10\text{ Vdc}$ , $f = 1.0\text{ kHz}$ )		$h_{fe}$	25	– –

1. Pulse Test: Pulse width  $\leq 300\ \mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .