

NPN  
**2N5629**  
**2N5630**  
**2N5631**

PNP  
**2N6029**  
**2N6030**  
**2N6031**

**HIGH-VOLTAGE – HIGH POWER TRANSISTORS**

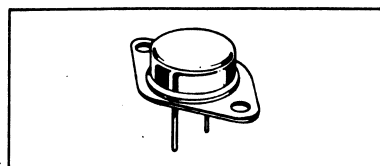
... designed for use in high power audio amplifier applications and high voltage switching regulator circuits.

- High Collector-Emitter Sustaining Voltage –  
 $V_{CE(sus)} = 100 \text{ Vdc} - 2N5629, 2N6029$   
 $= 120 \text{ Vdc} - 2N5630, 2N6030$   
 $= 140 \text{ Vdc} - 2N5631, 2N6031$
- High DC Current Gain – @  $I_C = 8.0 \text{ Adc}$   
 $h_{FE} = 25 \text{ (Min)} - 2N5629, 2N6029$   
 $= 20 \text{ (Min)} - 2N5630, 2N6030$   
 $= 15 \text{ (Min)} - 2N5631, 2N6031$
- Low Collector-Emitter Saturation Voltage –  
 $V_{CE(sat)} = 1.0 \text{ Vdc (Max)} @ I_C = 10 \text{ Adc}$

**16 AMPERE**

**POWER TRANSISTORS**  
**COMPLEMENTARY SILICON**

**100-120-140 VOLTS**  
**200 WATTS**



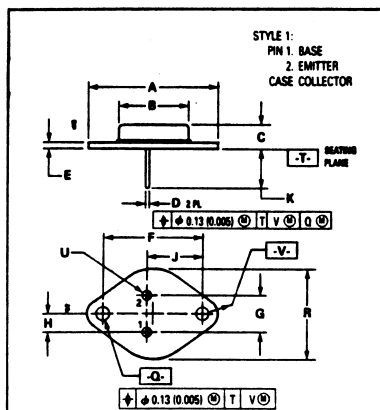
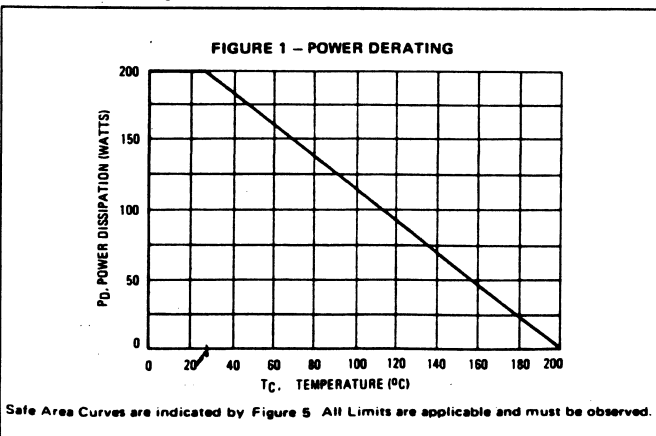
**\*MAXIMUM RATINGS**

Rating	Symbol	2N5629 2N6029	2N5630 2N6030	2N5631 2N6031	Unit
Collector-Emitter Voltage	$V_{CEO}$	100	120	140	Vdc
Collector-Base Voltage	$V_{CB}$	100	120	140	Vdc
Emitter-Base Voltage	$V_{EB}$	7.0			Vdc
Collector Current - Continuous	$I_C$	16			Adc
Peak		20			
Base Current - Continuous	$I_B$	5.0			Adc
Total Device Dissipation @ $T_C = 25^\circ\text{C}$	$P_D$	200			Watts
Derate above $25^\circ\text{C}$		1.14			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	$\theta_{JC}$	0.875	$^\circ\text{C/W}$

\* Indicates JEDEC Registered Data.



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  2. CONTROLLING DIMENSION: INCH.
  3. ALL RULES AND NOTES ASSOCIATED WITH REFERENCED TO-204AA OUTLINE SHALL APPLY.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	—	39.27	—	1.550
B	—	21.00	—	0.830
C	6.35	8.25	0.250	0.325
D	0.97	1.00	0.038	0.043
E	1.40	1.77	0.055	0.070
F	30.15 BSC		1.187 BSC	
G	10.92 BSC		0.430 BSC	
H	5.40 BSC		0.215 BSC	
J	16.89 BSC		0.665 BSC	
K	11.18	12.19	0.440	0.480
Q	3.84	4.19	0.151	0.165
R	—	26.97	—	1.059
U	4.83	5.33	0.190	0.210
V	3.84	4.19	0.151	0.165

**CASE 1-06**  
**TO-204AA**  
**(TO-3)**



**2N5629, 2N5630, 2N5631 NPN**  
**2N6029, 2N6030, 2N6031 PNP**

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

Characteristic	Symbol	Min	Max	Unit	
<b>OFF CHARACTERISTICS</b>					
Collector-Emitter Sustaining Voltage (1) ( $I_C = 200 \text{ mAdc}, I_B = 0$ )	2N5629, 2N6029 2N5630, 2N6030 2N5631, 2N6031	$V_{CE(sus)}$	100 120 140	— —	Vdc
Collector-Emitter Cutoff Current ( $V_{CE} = 50 \text{ Vdc}, I_B = 0$ ) ( $V_{CE} = 60 \text{ Vdc}, I_B = 0$ ) ( $V_{CE} = 70 \text{ Vdc}, I_B = 0$ )	2N5629, 2N6029 2N5630, 2N6030 2N5631, 2N6031	$I_{CEO}$	— — —	2.0 2.0 2.0	mAdc
Collector-Emitter Cutoff Current ( $V_{CE} = \text{Rated } V_{CB}, V_{EB(off)} = 1.5 \text{ Vdc}$ ) ( $V_{CE} = \text{Rated } V_{CB}, V_{EB(off)} = 1.5 \text{ Vdc}, T_C = 150^\circ\text{C}$ )		$I_{CEX}$	— —	2.0 7.0	mAdc
Collector-Base Cutoff Current ( $V_{CB} = \text{Rated } V_{CB}, I_E = 0$ )		$I_{CBO}$	—	2.0	mAdc
Emitter-Base Cutoff Current ( $V_{BE} = 7.0 \text{ Vdc}, I_C = 0$ )		$I_{EBO}$	—	5.0	mAdc
<b>ON CHARACTERISTICS (1)</b>					
DC Current Gain ( $I_C = 8.0 \text{ Adc}, V_{CE} = 2.0 \text{ Vdc}$ )  ( $I_C = 16 \text{ Adc}, V_{CE} = 2.0 \text{ Vdc}$ )	2N5629, 2N6029 2N5630, 2N6030 2N5631, 2N6031 All Types	$h_{FE}$	25 20 15 4.0	100 80 60 —	—
Collector-Emitter Saturation Voltage ( $I_C = 10 \text{ Adc}, I_B = 1.0 \text{ Adc}$ ) ( $I_C = 16 \text{ Adc}, I_B = 4.0 \text{ Adc}$ )	All Types	$V_{CE(sat)}$	— —	1.0 2.0	Vdc
Base-Emitter Saturation Voltage ( $I_C = 10 \text{ Adc}, I_B = 1.0 \text{ Adc}$ )		$V_{BE(sat)}$	—	1.8	Vdc
Base-Emitter On Voltage ( $I_C = 8.0 \text{ Adc}, V_{CE} = 2.0 \text{ Vdc}$ )		$V_{BE(on)}$	—	1.5	Vdc
<b>DYNAMIC CHARACTERISTICS</b>					
Current-Gain-Bandwidth Product (2) ( $I_C = 1.0 \text{ Adc}, V_{CE} = 20 \text{ Vdc}, f_{test} = 0.5 \text{ MHz}$ )		$f_T$	1.0	—	MHz
Output Capacitance ( $V_{CB} = 10 \text{ Vdc}, I_E = 0, f = 0.1 \text{ MHz}$ )	2N5629, 30, 31 2N6029, 30, 31	$C_{ob}$	—	500 1000	pF
Small-Signal Current Gain ( $I_C = 4.0 \text{ Adc}, V_{CE} = 10 \text{ Vdc}, f = 1.0 \text{ kHz}$ )		$h_{fe}$	15	—	—

\*Indicates JEDEC Registered Data.

(1) Pulse Test: Pulse Width  $\leq 300 \mu\text{s}$ , Duty Cycle  $\geq 2.0\%$ .

(2)  $f_T = |h_{fe}| \cdot f_{test}$

FIGURE 2 - SWITCHING TIMES TEST CIRCUIT

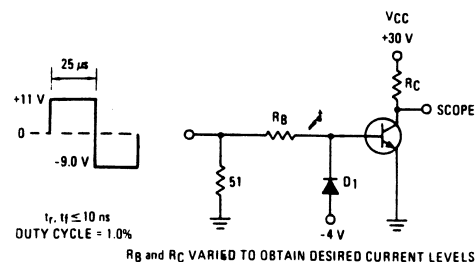
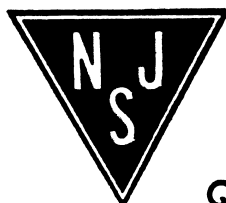
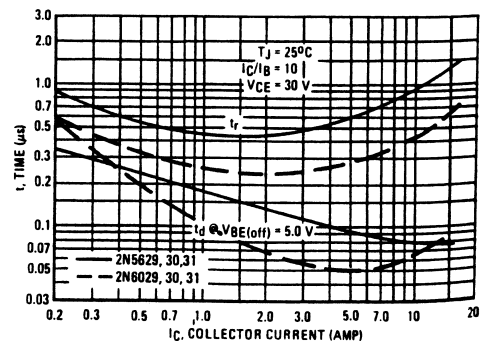


FIGURE 3 - TURN-ON TIME



For PNP test circuit, reverse all polarities and D1.