

## PNP HIGH POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/461

### Devices

2N6211

2N6212

2N6213

### Qualified Level

JAN  
JANTX  
JANTXV

### MAXIMUM RATINGS

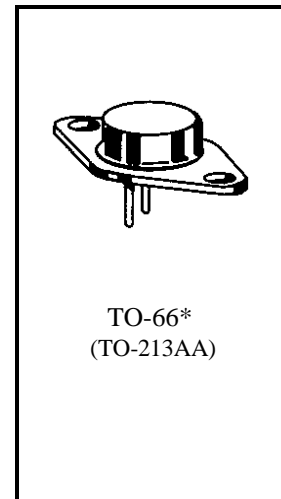
Ratings	Symbol	2N6211	2N6212	2N6213	Unit
Collector-Emitter Voltage	$V_{CEO}$	225	300	350	Vdc
Collector-Base Voltage	$V_{CBO}$	275	350	400	Vdc
Emitter-Base Voltage	$V_{EBO}$	6.0			Vdc
Base Current	$I_B$	1.0			Adc
Collector Current	$I_C$	2.0			Adc
Total Power Dissipation	$P_T$	@ $T_A = +25^{\circ}\text{C}$ <sup>(1)</sup>	3.0		W
		@ $T_C = +25^{\circ}\text{C}$ <sup>(2)</sup>	35		W
Operating & Storage Temperature	$T_{op}, T_{stg}$	-55 to +200			$^{\circ}\text{C}$

### THERMAL CHARACTERISTICS

Characteristics	Symbol	Max.	Unit
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	5.0	$^{\circ}\text{C}/\text{W}$

1) Derate linearly 17.1 mW/ $^{\circ}\text{C}$  for  $T_A > +25^{\circ}\text{C}$

2) Derate linearly 200 mW/ $^{\circ}\text{C}$  for  $T_C > +25^{\circ}\text{C}$



\*See appendix A for package outline

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

Characteristics	Symbol	Min.	Max.	Unit
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### OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage $I_C = 200 \text{ mAdc}, f = 30\text{-}60 \text{ Hz}$	2N6211 2N6212 2N6213	$V_{(BR)CEO}$	225 300 350	Vdc
Collector-Emitter Breakdown Voltage $I_C = 200 \text{ mAdc}, f = 30\text{-}60 \text{ Hz}, R_{BE} = 50 \Omega$	2N6211 2N6212 2N6213	$V_{(BR)CER}$	250 325 375	Vdc
Collector-Emitter Breakdown Voltage $I_C = 200 \text{ mAdc}, f = 30\text{-}60 \text{ Hz}, R_{BE} = 50 \Omega, V_{BE} = -1.5 \text{ Vdc}$	2N6211 2N6212 2N6213	$V_{(BR)CEX}$	275 350 400	Vdc

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**2N6211, 2N6212, 2N6213 JAN SERIES**

**ELECTRICAL CHARACTERISTICS (con't)**

Characteristics	Symbol	Min.	Max.	Unit
Collector-Emitter Cutoff Current $V_{CE} = 150 \text{ Vdc}$	$I_{CEO}$		5.0	mAdc
Collector-Emitter Cutoff Current $V_{CE} = 250 \text{ Vdc}, V_{BE} = 1.5 \text{ Vdc}$ $V_{CE} = 315 \text{ Vdc}, V_{BE} = 1.5 \text{ Vdc}$ $V_{CE} = 360 \text{ Vdc}, V_{BE} = 1.5 \text{ Vdc}$	$I_{CEX}$	2N6211 2N6212 2N6213	0.5 0.5 0.5	mAdc
Collector-Base Cutoff Current $V_{CB} = 275 \text{ Vdc}$ $V_{CB} = 350 \text{ Vdc}$ $V_{CB} = 400 \text{ Vdc}$	$I_{CBO}$	2N6211 2N6212 2N6213	15 15 15	mAdc
Emitter-Base Cutoff Current $V_{EB} = 6.0 \text{ Vdc}$	$I_{EBO}$		0.5	mAdc

**ON CHARACTERISTICS <sup>(3)</sup>**

Forward-Current Transfer Ratio $I_C = 1.0 \text{ Adc}, V_{CE} = 2.8 \text{ Vdc}$ $I_C = 1.0 \text{ Adc}, V_{CE} = 3.2 \text{ Vdc}$ $I_C = 1.0 \text{ Adc}, V_{CE} = 4.0 \text{ Vdc}$ $I_C = 1.0 \text{ Adc}, V_{CE} = 5.0 \text{ Vdc}$	$h_{FE}$	2N6211 2N6212 2N6213 2N6211 2N6212 2N6213	10 10 10 30 30 30	100 100 100 175 175 150	
Collector-Emitter Saturation Voltage $I_C = 1.0 \text{ Adc}, I_B = 0.125 \text{ Adc}$	$V_{CE(sat)}$	2N6211 2N6212 2N6213		1.4 1.6 2.0	Vdc
Base-Emitter Saturation Voltage $I_C = 1.0 \text{ Adc}, I_B = 0.125 \text{ Adc}$	$V_{BE(sat)}$			1.4	Vdc

**DYNAMIC CHARACTERISTICS**

Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio $I_C = 0.2 \text{ Adc}, V_{CE} = 10 \text{ Vdc}, f = 5.0 \text{ MHz}$	$ h_{fe} $		4.0	20	
Output Capacitance $V_{CB} = 10 \text{ Vdc}, I_E = 0, 100 \text{ kHz} \leq f \leq 1.0 \text{ MHz}$	$C_{obo}$			220	pF

**SWITCHING CHARACTERISTICS**

Turn-On Time $V_{CC} = 200 \pm 10 \text{ Vdc}; I_C = 1.0 \text{ Adc}; I_{B1} = -0.125 \text{ Adc}$	$t_{on}$			0.6	$\mu\text{s}$
Turn-Off Time $V_{CC} = 200 \pm 10 \text{ Vdc}; I_C = 1.0 \text{ Adc}; I_{B1} = -0.125 \text{ Adc}, I_{B2} = 0.125 \text{ Adc}$	$t_{off}$			3.1	$\mu\text{s}$

**SAFE OPERATING AREA**

<b>DC Tests</b> $T_C = +25^{\circ}\text{C}, 1 \text{ Cycle}, t = 1.0 \text{ s}$				
<b>Test 1</b> $V_{CE} = 17.5 \text{ Vdc}, I_C = 2.0 \text{ Adc}$ All Types				
<b>Test 2</b> $V_{CE} = 40 \text{ Vdc}, I_C = 0.875 \text{ Adc}$ All Types				
<b>Test 3</b> $V_{CE} = 225 \text{ Vdc}, I_C = 0.034 \text{ Adc}$ 2N6211				
<b>Test 4</b> $V_{CE} = 300 \text{ Vdc}, I_C = 0.02 \text{ Adc}$ 2N6212				
<b>Test 5</b> $V_{CE} = 350 \text{ Vdc}, I_C = 0.015 \text{ Adc}$ 2N6213				

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