

GENERAL PURPOSE SWITCHING AND AMPLIFIER TRANSISTORS (SILICON)

Current versus Voltage

BV _{CEO} Min Volts	OPTIMUM COLLECTOR CURRENT									
	0 to 10 mA		10 mA to 100 mA		100 mA to 500 mA		500 mA to 1.0 A		1.0 A to 3.0 A	
	NPN	PNP	NPN	PNP	NPN	PNP	NPN	PNP	NPN	PNP
15 ↓ 29	2N916 2N2330 2N2331		2N916 2N1983 2N1984		2N696 2N697 2N718 2N1420 2N2195	2N1991				
30 ↓ 39			2N2218 2N2219 2N2221 2N2222	2N3133 2N3134 2N3135 2N3136	2N2218 2N2219 2N2221 2N2222 2N3299 2N3300 2N3301 2N3302	2N2800 2N2801 2N2837 2N2838 2N3133 2N3134 2N3135				
49 ↓ 59	2N758 2N795 2N760 2N915 2N929 2N930 2N3946 2N3947	2N3250 2N3251 MM4048	2N2218A 2N2219A 2N2221A 2N2222A 2N2224 2N3946 2N3947	2N3250 2N3251	2N2194 2N2218A 2N2219A 2N2221A 2N2222A	2N2904 2N2905 2N2906 2N2907 2N3485 2N3486 2N4890	2N2192 2N2193	2N3244 2N3245	2N3506 2N3507	
60 ↓ 79	2N758A 2N759A 2N760A 2N929A 2N930A MM2483 MM2484	2N3798 2N3799 2N3250A 2N3251A	2N910 2N911 2N1990	2N3250A 2N3251A	2N656 2N699	2N2904A 2N2905A 2N2906A 2N2907A 2N3485A 2N3486A				
80 ↓ 99	2N739 2N740	2N3494 2N3496	2N720A 2N1893 2N2405	2N3494 2N3496	2N720A 2N3019 2N3020		2N3019 2N3020			
100 ↓ 149	2N4924	2N3495 2N3497 2N4928	2N3498 2N3499 2N4924	2N3495 2N3497 2N3634 2N3635 2N4928	2N3498 2N3499 2N4924	2N3634 2N3635				
150 ↓ 249	2N3114 2N4925 2N4926	2N4929 2N4930	2N3500 2N3501 2N4925 2N4926	2N3635 2N3637 2N4929 2N4930	2N3500 2N3501 2N4925	2N3636 2N3637				
250 UP	2N3742 2N4927	2N3743 2N4931	2N3742 2N4927	2N3743 2N4931						

2N910 (SILICON)
2N911

$V_{CEO} = 60 \text{ V}$
 $P_D = 500 \text{ mW}$
 $I_C = 1 \text{ A}$



NPN silicon annular transistors designed for small-signal amplifier and general purpose switching applications.

CASE 22
(TO-18)

Collector connected to case

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	60	Vdc
Collector-Emitter Voltage	V_{CER}	80	Vdc
Collector-Base Voltage	V_{CB}	100	Vdc
Emitter-Base Voltage	V_{EB}	7.0	Vdc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	0.5 2.86	Watt mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ $T_C = 100^\circ\text{C}$ Derate above 25°C	P_D	1.8 0.975 10.3	Watt mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200	$^\circ\text{C}$

— Switching and General Purpose Transistors —

2N910, 2N911 (Continued)

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

Characteristic	Symbol	Min	Max	Unit
Collector-Emitter Sustaining Voltage* ($I_C = 30 \text{ mAdc}$, $I_B = 0$)	$BV_{CEO(sus)}^*$	60	-	Vdc
Collector-Emitter Sustaining Voltage* ($I_C = 100 \text{ mAdc}$, $R_{BE} \leq 10 \text{ ohms}$)	$BV_{CER(sus)}^*$	80	-	Vdc
Collector-Base Breakdown Voltage ($I_C = 100 \mu\text{A}$, $I_E = 0$)	BV_{CBO}	100	-	Vdc
Emitter-Base Breakdown Voltage ($I_E = 100 \mu\text{A}$, $I_C = 0$)	BV_{EBO}	7.0	-	Vdc
Collector Cutoff Current ($V_{CB} = 75 \text{ Vdc}$, $I_E = 0$) ($V_{CB} = 75 \text{ Vdc}$, $I_E = 0$, $T_A = 150^\circ\text{C}$)	I_{CBO}	-	25	nA μA
Emitter Cutoff Current ($V_{BE} = 5.0 \text{ Vdc}$, $I_C = 0$)	I_{EBO}	-	25	nA

ON CHARACTERISTICS

DC Current Gain ($I_C = 0.1 \text{ mAdc}$, $V_{CE} = 10 \text{ Vdc}$)	2N910 2N911	h_{FE}	35 20	-	-
($I_C = 10 \text{ mAdc}$, $V_{CE} = 10 \text{ Vdc}$)	2N910* 2N911*		75 35	-	-
($I_C = 10 \text{ mAdc}$, $V_{CE} = 10 \text{ Vdc}$, $T_A = -55^\circ\text{C}$)	2N910* 2N911*		30 15	-	-
Collector-Emitter Saturation Voltage ($I_C = 10 \text{ mAdc}$, $I_B = 1.0 \text{ mAdc}$) ($I_C = 50 \text{ mAdc}$, $I_B = 5.0 \text{ mAdc}$)		$V_{CE(sat)}$	- -	0.4 1.2	Vdc
Base-Emitter Saturation Voltage ($I_C = 10 \text{ mAdc}$, $I_B = 1.0 \text{ mAdc}$) ($I_C = 50 \text{ mAdc}$, $I_B = 5.0 \text{ mAdc}$)		$V_{BE(sat)}$	0.6 -	0.8 0.9	Vdc

SMALL-SIGNAL CHARACTERISTICS

Current-Gain-Bandwidth Product ($I_C = 50 \text{ mAdc}$, $V_{CE} = 10 \text{ Vdc}$, $f = 20 \text{ MHz}$)	2N910 2N911	f_T	60 50	-	MHz
Output Capacitance ($V_{CB} = 10 \text{ Vdc}$, $I_E = 0$, $f = 100 \text{ kHz}$)		C_{ob}	-	15	pF
Input Capacitance ($V_{BE} = 0.5 \text{ Vdc}$, $I_C = 0$, $f = 100 \text{ kHz}$)		C_{ib}	-	85	pF
Input Impedance ($I_C = 5.0 \text{ mAdc}$, $V_{CE} = 5.0 \text{ Vdc}$, $f = 1.0 \text{ kHz}$)	2N910 2N911	h_{ie}	- -	1800 1000	Ohms
Small-Signal Current Gain ($I_C = 1.0 \text{ mAdc}$, $V_{CE} = 5.0 \text{ Vdc}$, $f = 1.0 \text{ kHz}$)	2N910 2N911	h_{fe}	76 36	200 90	-
($I_C = 5.0 \text{ mAdc}$, $V_{CE} = 5.0 \text{ Vdc}$, $f = 1.0 \text{ kHz}$)	2N911		40	100	
Output Admittance ($I_C = 5.0 \text{ mAdc}$, $V_{CE} = 5.0 \text{ Vdc}$, $f = 1.0 \text{ kHz}$)	2N910 2N911	h_{oe}	- -	100 50	μhos
Input Resistance ($I_C = 1.0 \text{ mAdc}$, $V_{CB} = 5.0 \text{ Vdc}$, $f = 1.0 \text{ kHz}$) ($I_C = 5.0 \text{ mAdc}$, $V_{CB} = 5.0 \text{ Vdc}$, $f = 1.0 \text{ kHz}$)		h_{ib}	20 4.0	30 8.0	Ohms
Voltage Feedback Ratio ($I_C = 1.0 \text{ mAdc}$, $V_{CB} = 5.0 \text{ Vdc}$, $f = 1.0 \text{ kHz}$)	2N910 2N911	h_{rb}	- -	3.0 1.25	$\times 10^{-4}$
($I_C = 5.0 \text{ mAdc}$, $V_{CB} = 5.0 \text{ Vdc}$, $f = 1.0 \text{ kHz}$)	2N911		-	1.75	
Output Conductance ($I_C = 1.0 \text{ mAdc}$, $V_{CB} = 5.0 \text{ Vdc}$, $f = 1.0 \text{ kHz}$) ($I_C = 5.0 \text{ mAdc}$, $V_{CB} = 5.0 \text{ Vdc}$, $f = 1.0 \text{ kHz}$)		h_{ob}	- -	0.5 1.0	μmho
Noise Figure ($I_C = 0.3 \text{ mAdc}$, $V_{CB} = 10 \text{ Vdc}$, $R_G = 510 \text{ ohms}$, $f = 1.0 \text{ kHz}$, B. W. = 200 Hz)	2N910 2N911	NF	- -	12 15	dB

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