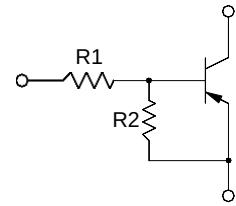




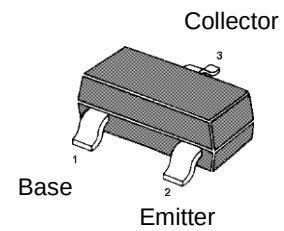
PNP Silicon Epitaxial Planar Transistor

for switching and interface circuit and drive circuit applications



Resistor Values

Device	Marking	R1 (K)	R2 (K)
MMUN5111W	6A	10	10
MMUN5112W	6B	22	22
MMUN5113W	P5	47	47
MMUN5114W	6D	10	47
MMUN5115W	6E	10	∞
MMUN5116W	6F	4.7	∞
MMUN5130W	6G	1.0	1.0
MMUN5131W	6H	2.2	2.2
MMUN5132W	6J	4.7	4.7
MMUN5133W	6K	4.7	47
MMUN5134W	6L	22	47
MMUN5135W	6M	2.2	47
MMUN5136W	6N	100	100
MMUN5137W	6P	47	22



SOT-323

Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$)

Parameter	Symbol	Value	Unit
Collector Base Voltage	$-V_{CBO}$	50	V
Collector Emitter Voltage	$-V_{CEO}$	50	V
Collector Current	$-I_C$	100	mA
Total Power Dissipation	P_{tot}	200	mW
Junction Temperature	T_j	150	$^\circ\text{C}$
Storage Temperature Range	T_s	- 55 to + 150	$^\circ\text{C}$



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

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Collector– Base Cutoff Current ($V_{CB} = 50\text{ V}$, $I_E = 0$)	ICBO	–	–	100	nAdc
Collector– Emitter Cutoff Current ($V_{CE} = 50\text{ V}$, $I_B = 0$)	ICEO	–	–	500	nAdc
Emitter– Base Cutoff Current ($V_{EB} = 6.0\text{ V}$, $I_C = 0$)	IEBO	–	–	0.5	mAdc
MMUN5111W		–	–	0.2	
MMUN5112W		–	–	0.1	
MMUN5113W		–	–	0.2	
MMUN5114W		–	–	0.9	
MMUN5115W		–	–	1.9	
MMUN5116W		–	–	4.3	
MMUN5130W		–	–	2.3	
MMUN5131W		–	–	1.5	
MMUN5132W		–	–	0.18	
MMUN5133W		–	–	0.13	
MMUN5134W		–	–	0.2	
MMUN5135W		–	–	0.05	
MMUN5136W		–	–	0.13	
MMUN5137W		–	–		
Collector– Base Breakdown Voltage ($I_C = 10\text{ }\mu\text{A}$, $I_E = 0$)	$V_{(BR)CBO}$	50	–	–	Vdc
Collector– Emitter Breakdown Voltage (Note 4) ($I_C = 2.0\text{ mA}$, $I_B = 0$)	$V_{(BR)CEO}$	50	–	–	Vdc

ON CHARACTERISTICS (Note 4)

DC Current Gain ($V_{CE} = 10\text{ V}$, $I_C = 5.0\text{ mA}$)	MMUN5111W MMUN5112W MMUN5113W MMUN5114W MMUN5115W MMUN5116W MMUN5130W MMUN5131W MMUN5132W MMUN5133W MMUN5134W MMUN5135W MMUN5136W MMUN5137W	h_{FE}	35 60 80 80 160 160 3.0 8.0 15 80 80 80 80 80 80	60 100 140 140 250 250 5.0 15 27 140 130 140 150 140	250 – – – – – – – – – – – – – –	
Collector– Emitter Saturation Voltage ($I_C = 10\text{ mA}$, $I_E = 0.3\text{ mA}$) ($I_C = 10\text{ mA}$, $I_B = 5\text{ mA}$) MMUN5130W/MMUN5131W ($I_C = 10\text{ mA}$, $I_B = 1\text{ mA}$) MMUN5115W/MMUN5116W/ MMUN5132W/MMUN5134W		$V_{CE(sat)}$	–	–	0.25	Vdc
Output Voltage (on) ($V_{CC} = 5.0\text{ V}$, $V_B = 2.5\text{ V}$, $R_L = 1.0\text{ k}\Omega$)	MMUN5111W MMUN5112W MMUN5114W MMUN5115W MMUN5116W MMUN5130W MMUN5131W MMUN5132W MMUN5133W MMUN5134W MMUN5135W MMUN5113W MMUN5136W MMUN5137W	V_{OL}	– – – – – – – – – – – – – – –	– – – – – – – – – – – – – – –	0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2	Vdc
($V_{CC} = 5.0\text{ V}$, $V_B = 3.5\text{ V}$, $R_L = 1.0\text{ k}\Omega$)					0.2	
($V_{CC} = 5.0\text{ V}$, $V_B = 5.5\text{ V}$, $R_L = 1.0\text{ k}\Omega$)					0.2	
($V_{CC} = 5.0\text{ V}$, $V_B = 4.0\text{ V}$, $R_L = 1.0\text{ k}\Omega$)					0.2	

4. Pulse Test: Pulse Width < 300 μs , Duty Cycle < 2.0%



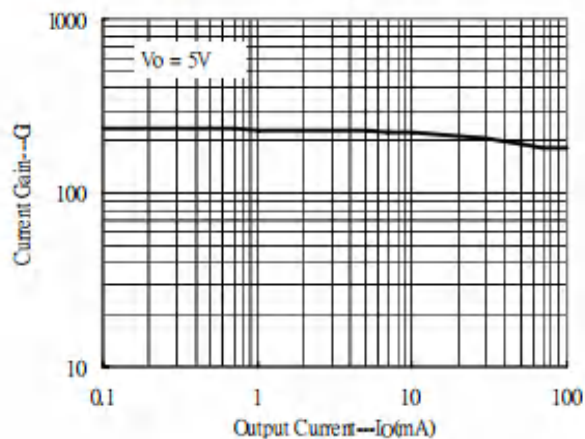
ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted) (Continued)

Characteristic	Symbol	Min	Typ	Max	Unit
Output Voltage (off) ($V_{CC} = 5.0\text{ V}$, $V_B = 0.5\text{ V}$, $R_L = 1.0\text{ k}\Omega$) ($V_{CC} = 5.0\text{ V}$, $V_B = 0.050\text{ V}$, $R_L = 1.0\text{ k}\Omega$) ($V_{CC} = 5.0\text{ V}$, $V_B = 0.25\text{ V}$, $R_L = 1.0\text{ k}\Omega$) MMUN5130W MMUN5115W MMUN5116W MMUN5131W MMUN5132W	V_{OH}	4.9	–	–	Vdc
Input Resistor MMUN5111W MMUN5112W MMUN5113W MMUN5114W MMUN5115W MMUN5116W MMUN5130W MMUN5131W MMUN5132W MMUN5133W MMUN5134W MMUN5135W MMUN5136W MMUN5137W	R_1	7.0 15.4 32.9 7.0 7.0 3.3 0.7 1.5 3.3 3.3 15.4 1.54 70 32.9	10 22 47 10 10 4.7 1.0 2.2 4.7 4.7 22 2.2 100 47	13 28.6 61.1 13 13 6.1 1.3 2.9 6.1 6.1 28.6 2.86 130 61.1	$\text{k}\Omega$
Resistor Ratio MMUN5111W/MMUN5112W/MMUN5113W/ MMUN5136W MMUN5114W MMUN5115W/MMUN5116W MMUN5130W/MMUN5131W/MMUN5132W MMUN5133W MMUN5134W MMUN5135W MMUN5137W	R_1/R_2	0.8 0.17 – 0.8 0.055 0.38 0.038 1.7	1.0 0.21 – 1.0 0.1 0.47 0.047 2.1	1.2 0.25 – 1.2 0.185 0.56 0.056 2.6	

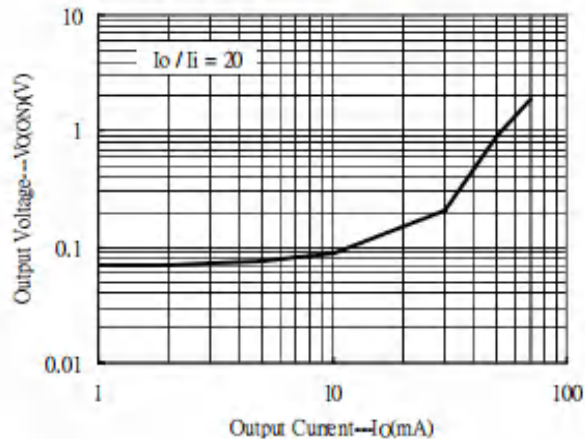


Characteristic Curves

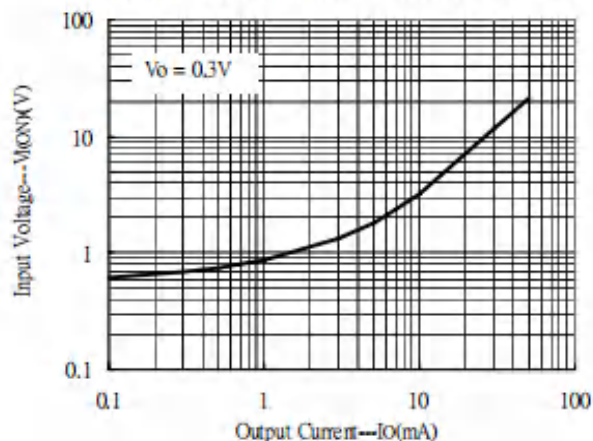
Current Gain vs Output Current



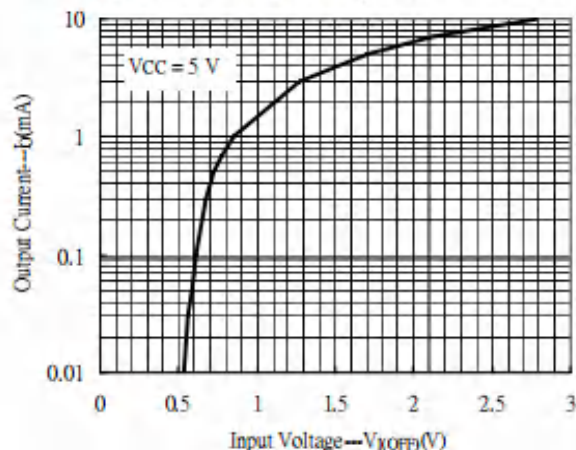
Output Voltage vs Output Current



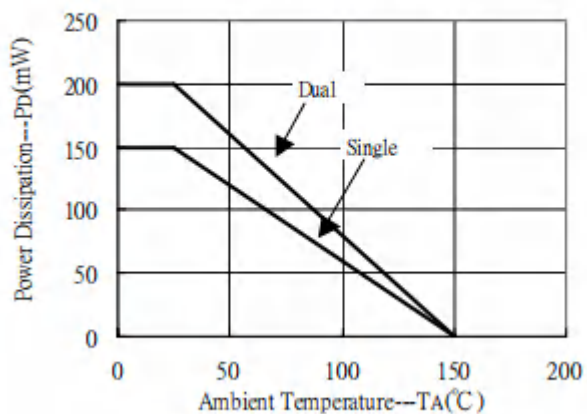
Input Voltage vs Output Current(ON characteristics)



Output Current vs Input Voltage(OFF characteristics)

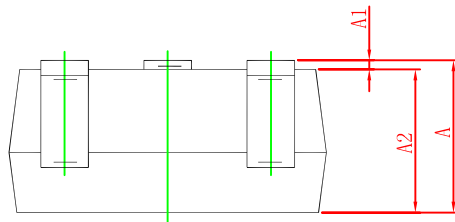
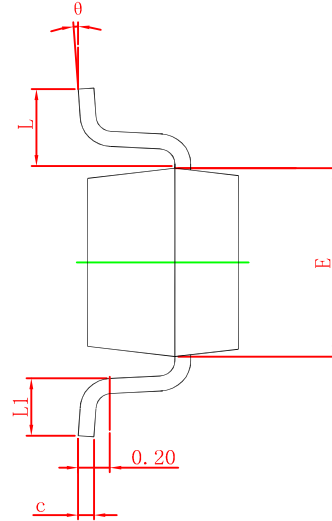
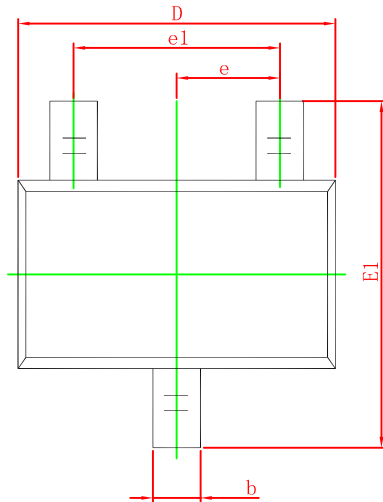


Power Derating Curves





SOT-323 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.200	0.400	0.008	0.016
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP.		0.026 TYP.	
e1	1.200	1.400	0.047	0.055
L	0.525 REF.		0.021 REF.	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°