

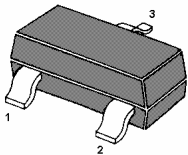
MMUN2111...MMUN2134

PNP Silicon Epitaxial Planar Transistor

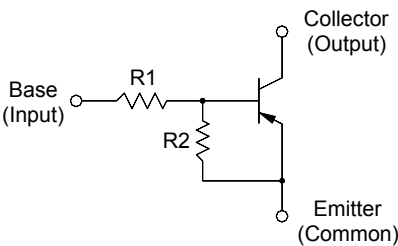
for switching and interface circuit and drive circuit applications

Resistor Values

Type	R1 (K)	R2 (K)
MMUN2111	10	10
MMUN2112	22	22
MMUN2113	47	47
MMUN2114	10	47
MMUN2115	10	∞
MMUN2116	4.7	∞
MMUN2130	1	1
MMUN2131	2.2	2.2
MMUN2132	4.7	4.7
MMUN2133	4.7	47
MMUN2134	22	47

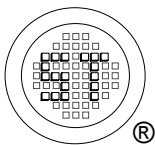


1. Base 2. Emitter 3. Collector
SOT-23 Plastic Package



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

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	$^{\circ}\text{C}$



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ISO/TS 16949 : 2002
Certificate No. 05103



ISO 14001:2004
Certificate No. 7116

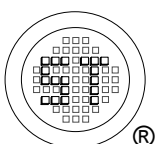


ISO 9001:2000
Certificate No. 0506098

Dated : 17/08/2007

Characteristics at $T_a = 25\text{ }^{\circ}\text{C}$

Parameter	Symbol	Min.	Max.	Unit
DC Current Gain at $-V_{CE} = 10\text{ V}$, $-I_C = 5\text{ mA}$				
MMUN2111	h_{FE}	35	-	-
MMUN2112	h_{FE}	60	-	-
MMUN2113	h_{FE}	80	-	-
MMUN2114	h_{FE}	80	-	-
MMUN2115	h_{FE}	160	-	-
MMUN2116	h_{FE}	160	-	-
MMUN2130	h_{FE}	3	-	-
MMUN2131	h_{FE}	8	-	-
MMUN2132	h_{FE}	15	-	-
MMUN2133	h_{FE}	80	-	-
MMUN2134	h_{FE}	80	-	-
Collector Base Cutoff Current at $-V_{CB} = 50\text{ V}$	$-I_{CBO}$	-	100	nA
Collector Emitter Cutoff Current at $-V_{CE} = 50\text{ V}$	$-I_{CEO}$	-	500	nA
Emitter Base Cutoff Current at $-V_{EB} = 6\text{ V}$				
MMUN2111	$-I_{EBO}$	-	0.5	mA
MMUN2112	$-I_{EBO}$	-	0.2	mA
MMUN2113	$-I_{EBO}$	-	0.1	mA
MMUN2114	$-I_{EBO}$	-	0.2	mA
MMUN2115	$-I_{EBO}$	-	0.9	mA
MMUN2116	$-I_{EBO}$	-	1.9	mA
MMUN2130	$-I_{EBO}$	-	4.3	mA
MMUN2131	$-I_{EBO}$	-	2.3	mA
MMUN2132	$-I_{EBO}$	-	1.5	mA
MMUN2133	$-I_{EBO}$	-	0.18	mA
MMUN2134	$-I_{EBO}$	-	0.13	mA
Collector Base Breakdown Voltage at $-I_C = 10\text{ }\mu\text{A}$	$-V_{(BR)CBO}$	50	-	V
Collector Emitter Breakdown Voltage at $-I_C = 2\text{ mA}$	$-V_{(BR)CEO}$	50	-	V
Collector Emitter Saturation Voltage at $-I_C = 10\text{ mA}$, $-I_B = 0.3\text{ mA}$	$-V_{CEsat}$	-	0.25	V
at $-I_C = 10\text{ mA}$, $-I_B = 5\text{ mA}$	MMUN2130 $-V_{CEsat}$	-	0.25	V
	MMUN2131 $-V_{CEsat}$	-	0.25	V
at $-I_C = 10\text{ mA}$, $-I_B = 1\text{ mA}$	MMUN2115 $-V_{CEsat}$	-	0.25	V
	MMUN2116 $-V_{CEsat}$	-	0.25	V
	MMUN2132 $-V_{CEsat}$	-	0.25	V
	MMUN2133 $-V_{CEsat}$	-	0.25	V
	MMUN2134 $-V_{CEsat}$	-	0.25	V



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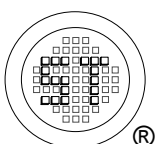


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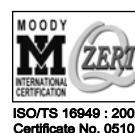
Characteristics at $T_a = 25\text{ }^{\circ}\text{C}$

Parameter		Symbol	Min.	Max.	Unit
Output Voltage (on) at $-V_{CC} = 5\text{ V}$, $-V_B = 2.5\text{ V}$, $R_L = 1\text{ K}\Omega$	MMUN2111	$-V_{OL}$	-	0.2	V
	MMUN2112	$-V_{OL}$	-	0.2	V
	MMUN2114	$-V_{OL}$	-	0.2	V
	MMUN2115	$-V_{OL}$	-	0.2	V
	MMUN2116	$-V_{OL}$	-	0.2	V
	MMUN2130	$-V_{OL}$	-	0.2	V
	MMUN2131	$-V_{OL}$	-	0.2	V
	MMUN2132	$-V_{OL}$	-	0.2	V
	MMUN2133	$-V_{OL}$	-	0.2	V
	MMUN2134	$-V_{OL}$	-	0.2	V
	MMUN2113	$-V_{OL}$	-	0.2	V
Output Voltage (off) at $-V_{CC} = 5\text{ V}$, $-V_B = 0.5\text{ V}$, $R_L = 1\text{ K}\Omega$ at $-V_{CC} = 5\text{ V}$, $-V_B = 0.05\text{ V}$, $R_L = 1\text{ K}\Omega$ at $-V_{CC} = 5\text{ V}$, $-V_B = 0.25\text{ V}$, $R_L = 1\text{ K}\Omega$	MMUN2130	$-V_{OH}$	4.9	-	V
	MMUN2115	$-V_{OH}$	4.9	-	V
	MMUN2116	$-V_{OH}$	4.9	-	V
	MMUN2131	$-V_{OH}$	4.9	-	V
	MMUN2132	$-V_{OH}$	4.9	-	V
Input Resistor	MMUN2111	R1	7	13	K Ω
	MMUN2112	R1	15.4	28.6	K Ω
	MMUN2113	R1	32.9	61.1	K Ω
	MMUN2114	R1	7	13	K Ω
	MMUN2115	R1	7	13	K Ω
	MMUN2116	R1	3.3	6.1	K Ω
	MMUN2130	R1	0.7	1.3	K Ω
	MMUN2131	R1	1.5	2.9	K Ω
	MMUN2132	R1	3.3	6.1	K Ω
	MMUN2133	R1	3.3	6.1	K Ω
	MMUN2134	R1	15.4	28.6	K Ω
Resistor Ratio	MMUN2111/MMUN2112/MMUN2113	R1/R2	0.8	1.2	-
	MMUN2114	R1/R2	0.17	0.25	-
	MMUN2115/MMUN2116	R1/R2	-	-	-
	MMUN2130/MMUN2131/MMUN2132	R1/R2	0.8	1.2	-
	MMUN2133	R1/R2	0.055	0.185	-



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