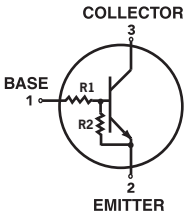
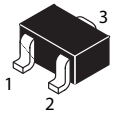
WEITRON

MUN5211 Series

NPN Silicon Bias Resistor Transistor

Lead(Pb)-Free





SOT-323(SC-70)

Maximum Ratings (T_A=25°C unless otherwise noted)

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	50	Vdc
Collector-Base Voltage	V_{CBO}	50	Vdc
Collector Current-Continuous	I_C	100	mAdc

Thermal Characteristics

Characteristics	Symbol	Max	Unit
Total Device Dissipation FR-5 Board (1)T_A=25°C Derate above 25°C	P_D	202 1.6	mW mW/°C
Thermal Resistance, Junction to Ambient (1)	$R_{\theta JA}$	618	°C/W
Junction and Storage, Temperature Range	$T_{J,Tstg}$	-55 to +150	°C

1.FR-4 @ minimum pad

2.FR-4 @ 1.0×1.0 inch Pad

Device Marking and Resistor Values

Device	Marking	R1(K)	R2(K)	Device	Marking	R1(K)	R2(K)
MUN5211	8A	10	10	MUN5231	8H	2.2	2.2
MUN5212	8B	22	22	MUN5232	8J	4.7	4.7
MUN5213	8C	47	47	MUN5233	8K	4.7	47
MUN5214	8D	10	47	MUN5234	8L	22	47
MUN5215	8E	10	∞	MUN5235	8M	2.2	47
MUN5216	8F	4.7	∞	MUN5236	8N	100	100
MUN5230	8G	1.0	1.0	MUN5237	8P	47	22

Electrical Characteristics (TA=25°C Unless Otherwise noted)

Characteristics		Symbol	Min	Typ	Max	Unit
Off Characteristics						
Collector-Emitter Breakdown Voltage (I_C=2.0mA, I_B=0)		V(BR)CEO	50	-	-	V
Collector-Base Breakdown Voltage (I_C=10 uA ,I_E=0)		V(BR)CBO	50	-	-	V
Collector-Base Cutoff Voltage (V_{CB}=50 V, I_E=0)		ICBO	-	-	100	nA
Collector-Emitter Cutoff Current (I_{CE}=50V, I_B=0)		ICEO	-	-	500	nA
Emitter-Base Cutoff Current (V_{EB}=6.0V, I_C=0)	MUN5211	IEBO	-	-	0.5	mA
	MUN5212		-	-	0.2	
	MUN5213		-	-	0.1	
	MUN5214		-	-	0.2	
	MUN5215		-	-	0.9	
	MUN5216		-	-	1.9	
	MUN5230		-	-	4.3	
	MUN5231		-	-	2.3	
	MUN5232		-	-	1.5	
	MUN5233		-	-	0.18	
	MUN5234		-	-	0.13	
	MUN5235		-	-	0.2	
	MUN5236		-	-	0.05	
	MUN5237		-	-	0.13	

Electrical Characteristics (TA=25°C Unless Otherwise noted)

Characteristics	Symbol	Min	Typ	Max	Unit

On Characteristics (3)

DC Current Gain (V_{CE}=10V, I_C=5.0mA)	MUN5211	h_{FE}	35	60	-	
	MUN5212		60	100	-	
	MUN5213		80	140	-	
	MUN5214		80	140	-	
	MUN5215		160	350	-	
	MUN5216		160	350	-	
	MUN5230		3.0	5.0	-	
	MUN5231		8.0	15	-	
	MUN5232		15	30	-	
	MUN5233		80	200	-	
	MUN5234		80	150	-	
	MUN5235		80	140	-	
	MUN5236		80	150	-	
	MUN5237		80	140	-	
Collector-Emitter Saturation Voltage (I_C=10mA, I_B=0.3mA) (I_C=10mA, I_B=5mA) (I_C=10mA, I_B=1mA)	MUN5230/MUN5231 MUN5215/MUN5216 MUN5232/MUN5233/MUN5234	$V_{CE(sat)}$	-	-	0.25	Vdc
Output Voltage(on) (V_{CC}=5.0V, V_B=2.5V, R_L=1.0kΩ)	MUN5211	V_{OL}	-	-	0.2	Vdc
	MUN5212		-	-	0.2	
	MUN5214		-	-	0.2	
	MUN5215		-	-	0.2	
	MUN5216		-	-	0.2	
	MUN5230		-	-	0.2	
	MUN5231		-	-	0.2	
	MUN5232		-	-	0.2	
	MUN5233		-	-	0.2	
	MUN5234		-	-	0.2	
	MUN5235		-	-	0.2	
(V_{CC}=5.0V, V_B=3.5V, R_L=1.0kΩ)	MUN5213		-	-	0.2	
(V_{CC}=5.0V, V_B=5.5V, R_L=1.0kΩ)	MUN5236		-	-	0.2	
(V_{CC}=5.0V, V_B=4.0V, R_L=1.0kΩ)	MUN5237		-	-	0.2	
Output Voltage(off) (V_{CC}=5.0V, V_B=0.5V, R_L=1.0kΩ) (V_{CC}=5.0V, V_B=0.050V, R_L=1.0kΩ) (V_{CC}=5.0V, V_B=0.25V, R_L=1.0kΩ)	MUN5230 MUN5215/MUN5216/MUN5233	V_{OH}	4.9	-	-	Vdc

3. Pulse Test: Pulse Width< 300 us, Duty Cycle< 2.0%

Electrical Characteristics (TA=25°C Unless Otherwise noted)

Characteristics		Symbol	Min	Typ	Max	Unit
On Characteristics						
Input Resistor	MUN5211	R1	7.0	10	13	kΩ
	MUN5212		15.4	22	28.6	
	MUN5213		32.9	47	61.1	
	MUN5214		7.0	10	13	
	MUN5215		7.0	10	13	
	MUN5216		3.3	4.7	6.1	
	MUN5230		0.7	1.0	1.3	
	MUN5231		1.5	2.2	2.9	
	MUN5232		3.3	4.7	6.1	
	MUN5233		3.3	4.7	6.1	
	MUN5234		15.4	22	28.6	
	MUN5235		1.54	2.2	2.86	
	MUN5236		70	100	130	
	MUN5237		32.9	47	61.1	
Resistor Ratio MUN5211/MUN5212		R1/R2				
MUN5213/MUN5236			0.8	1.0	1.2	
MUN5214			0.17	0.21	0.25	
MUN5215/MUN5216			-	-	-	
MUN5230/MUN5231/MUN5232			0.8	1.0	1.2	
MUN5233			0.055	0.1	0.185	
MUN5234			0.38	0.47	0.56	
MUN5235			0.038	0.047	0.056	
MUN5237			1.7	2.1	2.6	

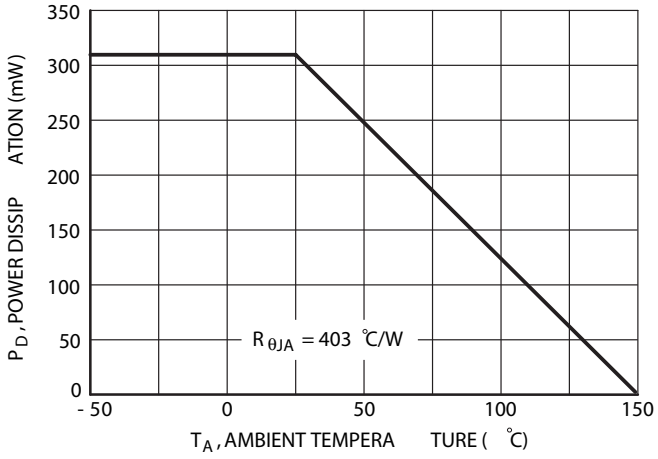


FIG 1. Derating Curve

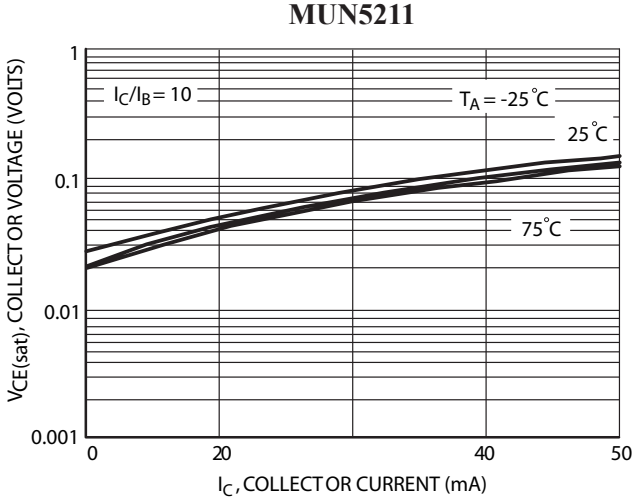


FIG.2 $V_{CE(sat)}$ versus I_C

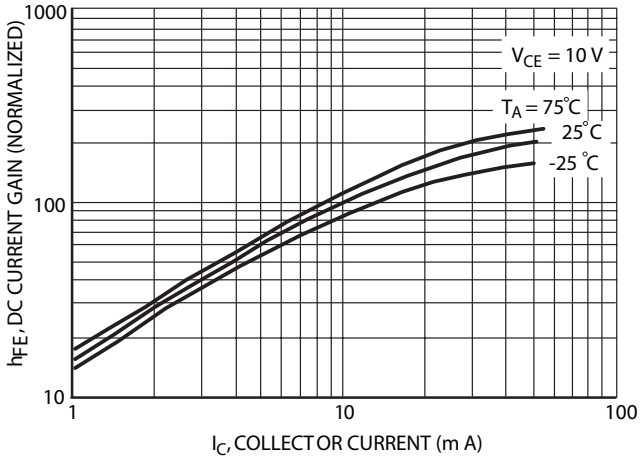


FIG.3 DC Current Gain

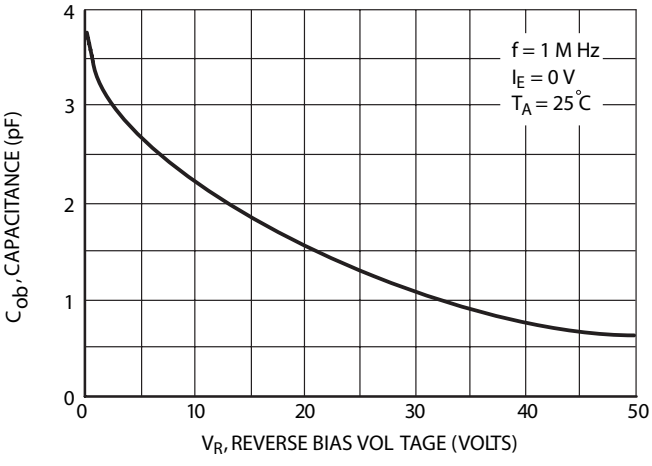


FIG.4 Output Capacitance

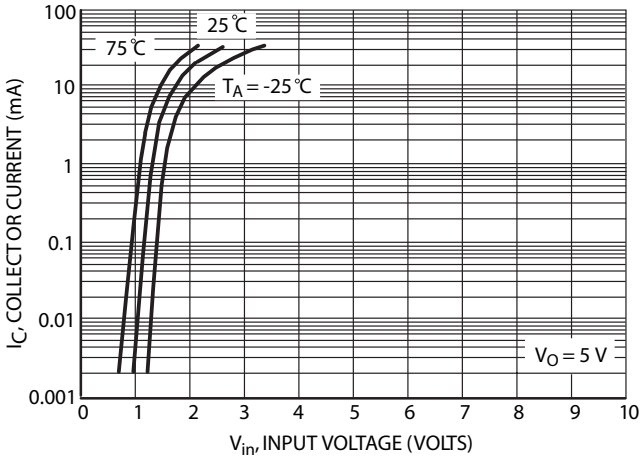


FIG.5 Output Current versus Input Voltage

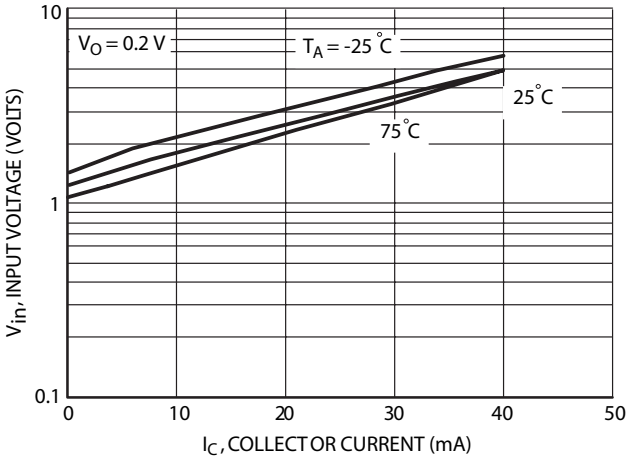
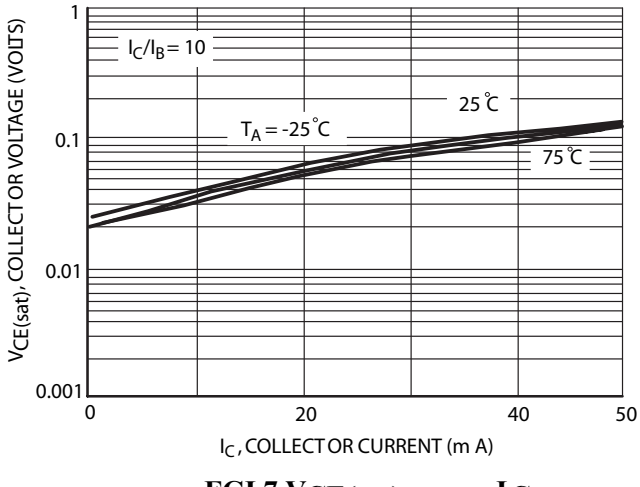


FIG.6 Input Voltage versus Output Current

MUN5212



FGI.7 $V_{CE(sat)}$ versus I_C

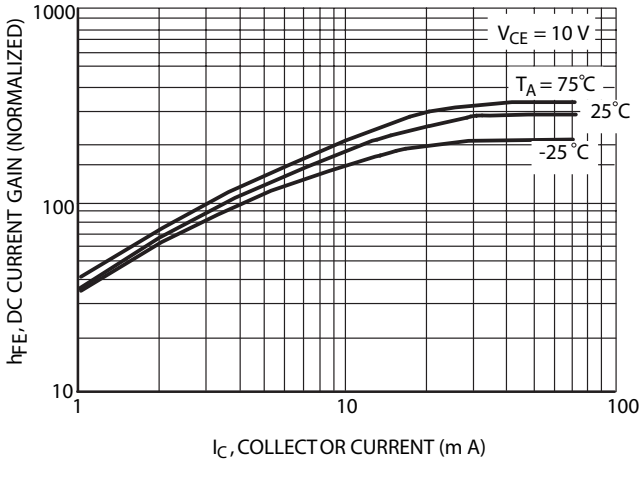


FIG.8 DC Current Gain

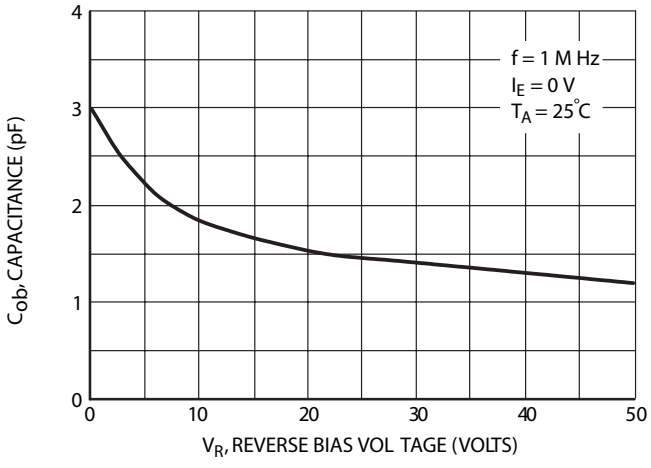


FIG.9 Output Capacitance

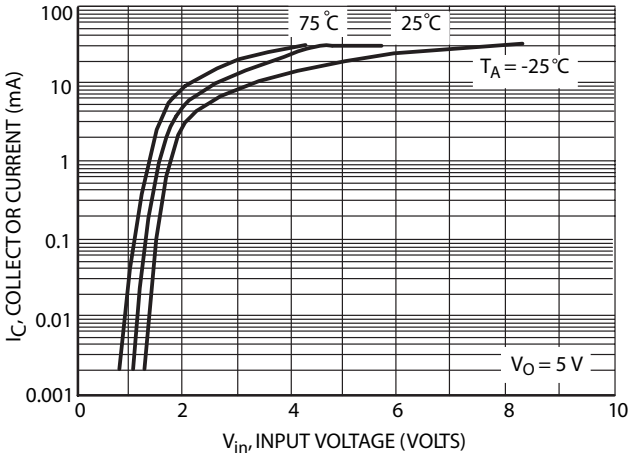


FIG.10 Output Current versus Input Voltage

MUN5213

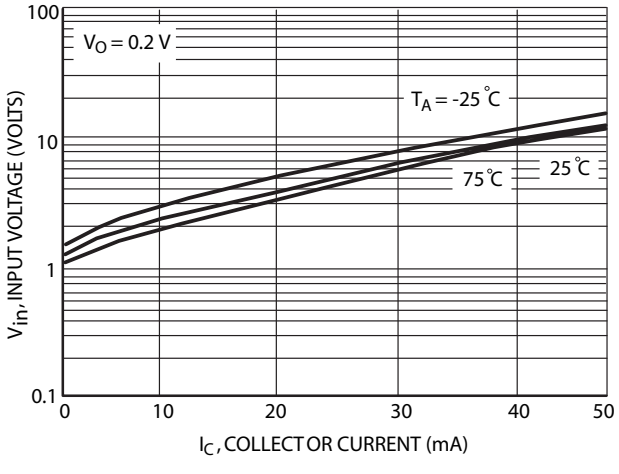


FIG.11 Input Voltage versus Output Current

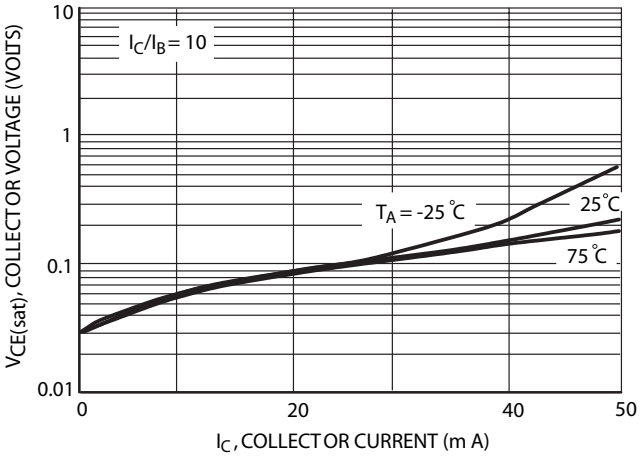


FIG.12 $V_{CE(sat)}$ versus I_C

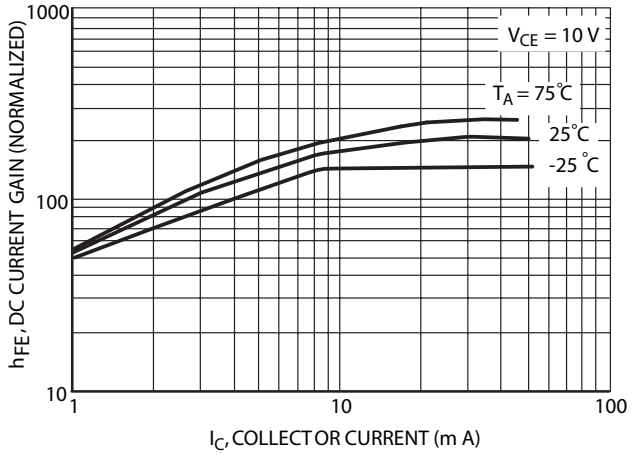


FIG.13 DC Current Gain

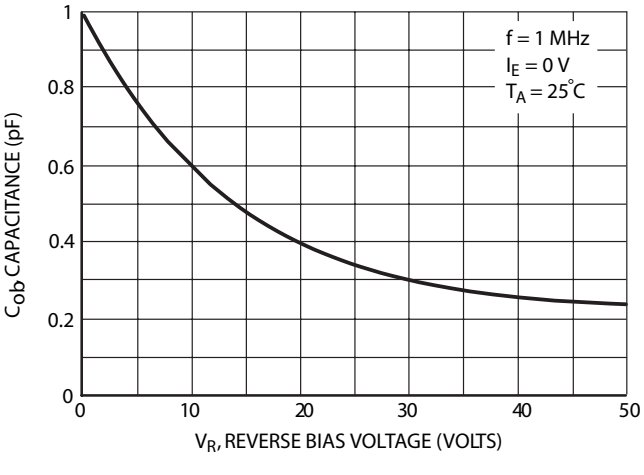


FIG.14 Output Capacitance

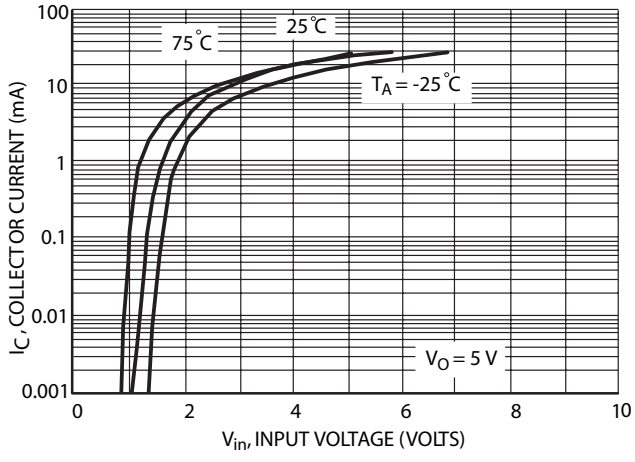


FIG.15 Output Current versus Input Voltage

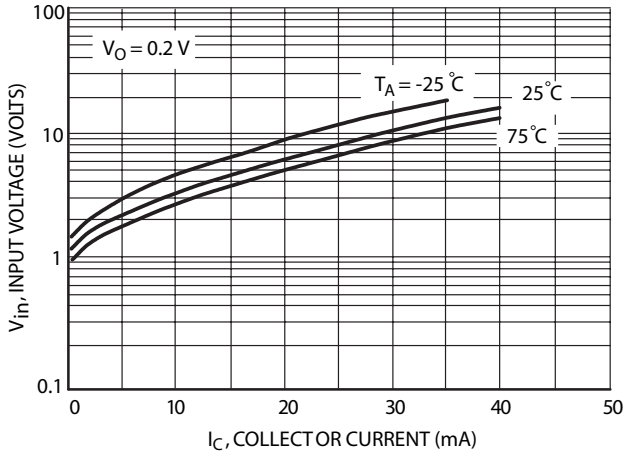


FIG.16 Input Voltage versus Output Current

MUN5214

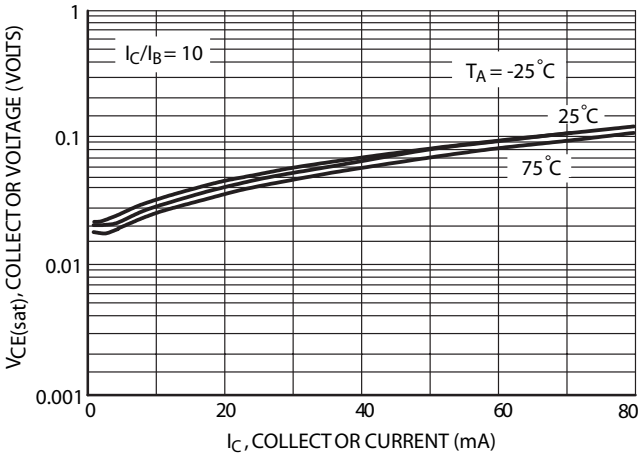


FIG.17 $V_{CE(sat)}$ versus I_C

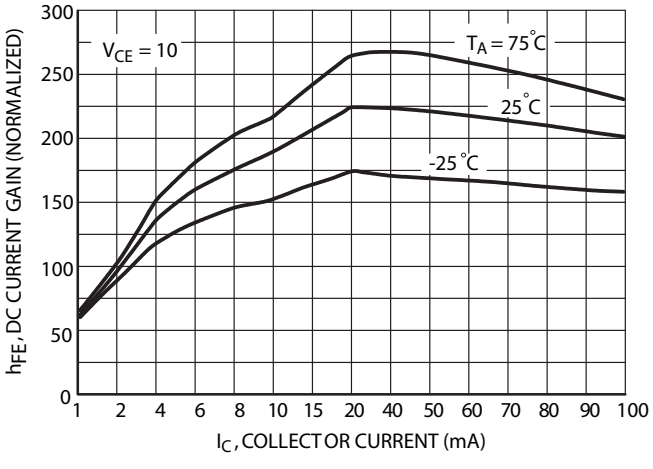


FIG.18 DC Current Gain

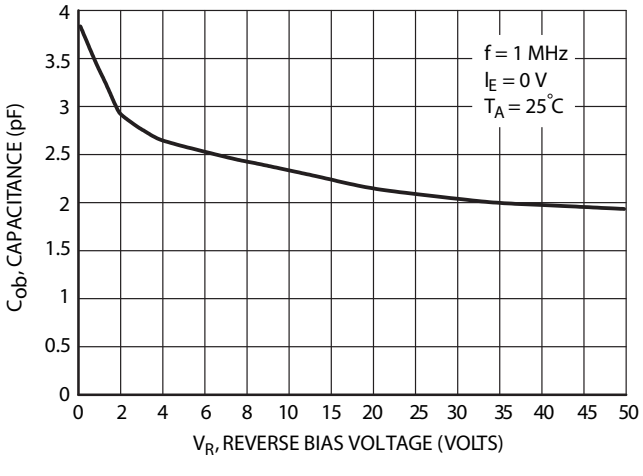


FIG.19 Output Capacitance

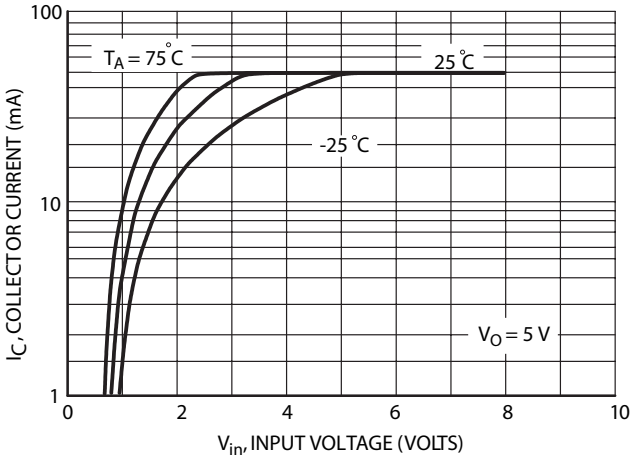


FIG.20 Output Current versus Input Voltage

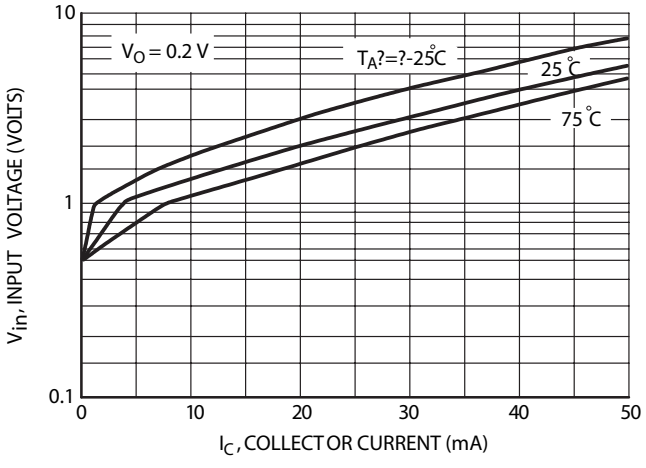
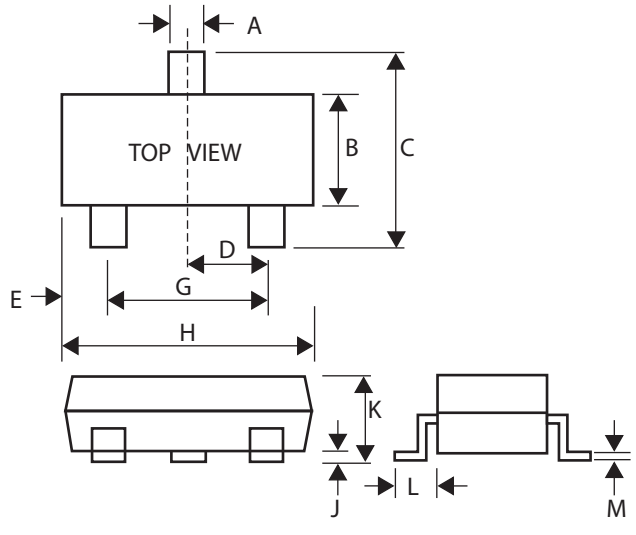


FIG.21 Input Voltage versus Output Current

SOT-323 Outline Demensions

Unit:mm



SOT-323		
Dim	**Min**	**Max**
A	0.30	0.40
B	1.15	1.35
C	2.00	2.40
D	-	0.65
E	0.30	0.40
G	1.20	1.40
H	1.80	2.20
J	0.00	0.10
K	0.80	1.00
L	0.42	0.53
M	0.10	0.25