



YOUSHANG SEMICONDUCTOR

设计研发新型功率器件

各类小信号开关

中低压及高压大电流等场效应管

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Description

This bipolar junction transistor (BJT) is designed to meet the stringent requirements of automotive applications.

Features

- Ideally Suited for Automated Assembly Processes
- Ultra Low Collector-Emitter Saturation Voltage
- Complementary NPN Type Available (NK-DSS60601MZ4Q)
- Ideal for Medium Power Switching or Amplification Applications

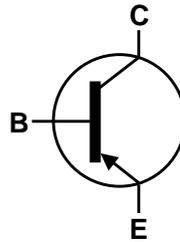
Mechanical Data

- Case: SOT223
- Case Material: Molded Plastic. "Green" Molding Compound.
- UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.112 grams (Approximate)

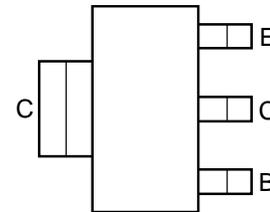
SOT223



Top View



Device Symbol



Top View
Pin-Out

Absolute Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CB0}	-100	V
Collector-Emitter Voltage	V _{CEO}	-60	V
Emitter-Base Voltage	V _{EBO}	-7	V
Continuous Collector Current	I _C	-6	A
Peak Pulse Current	I _{CM}	-12	A

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

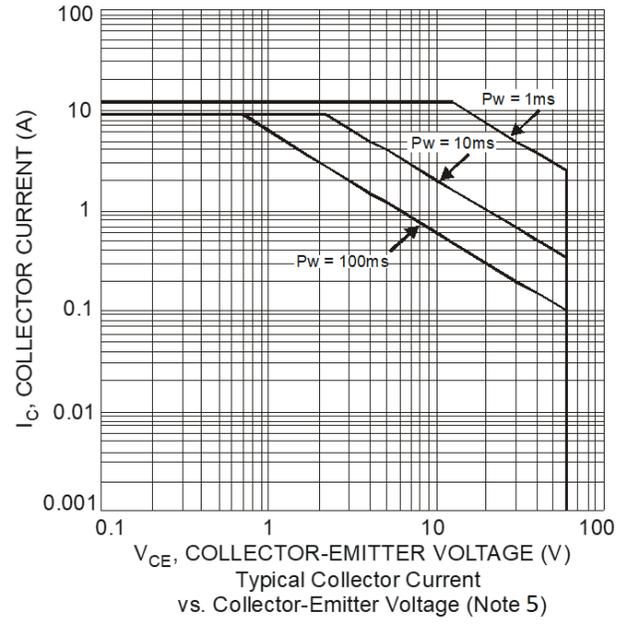
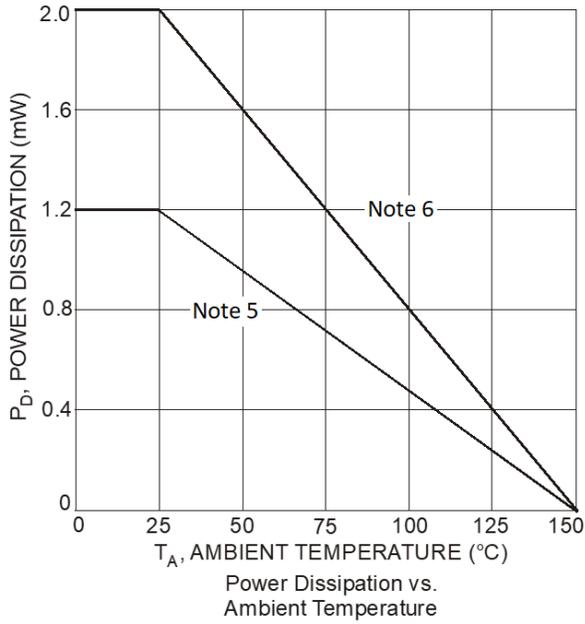
Characteristic	Symbol	Value	Unit
Power Dissipation	P _D	1.2	W
		2.0	W
Thermal Resistance, Junction to Ambient	R _{θJA}	104	°C/W
		62.5	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

ESD Ratings (Note 8)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge—Human Body Model	ESD HBM	4000	V	3A
Electrostatic Discharge—Machine Model	ESD MM	400	V	C

- Notes:
6. Device mounted on FR-4 PCB with minimum recommended pad layout.
 7. Device mounted on Polyimide PCB with 330mm² 2oz. Copper pad layout.
 8. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristics and Derating Information

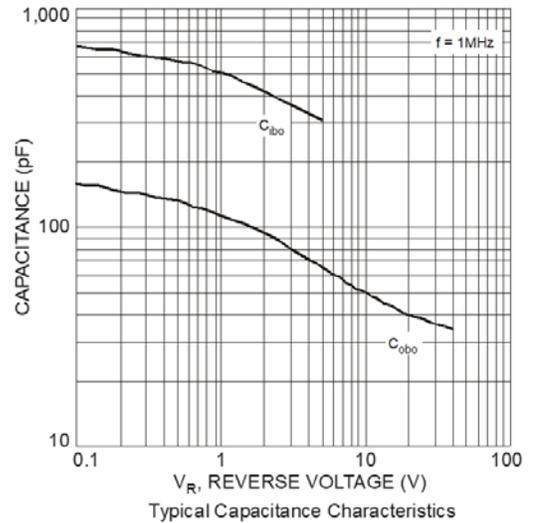
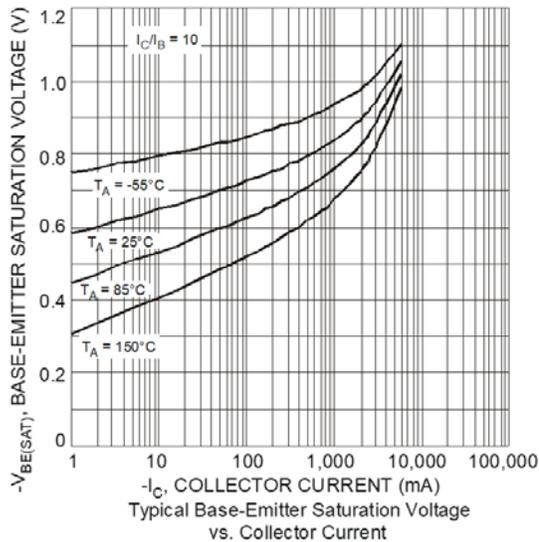
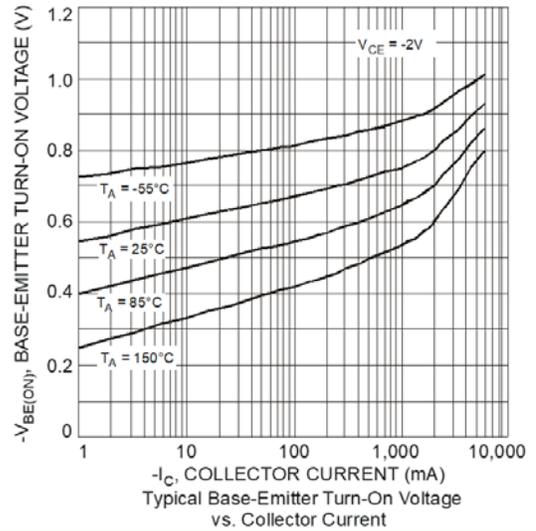
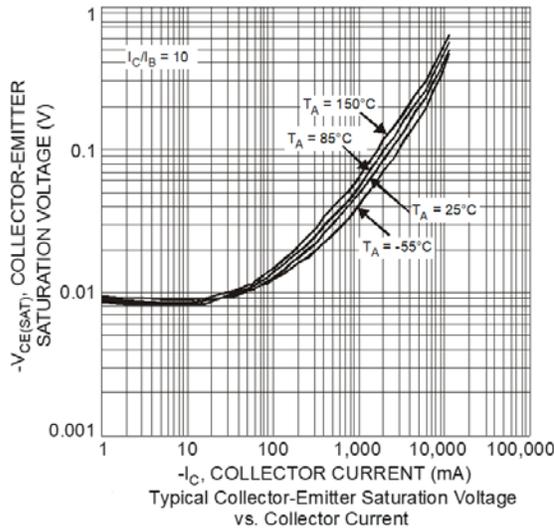
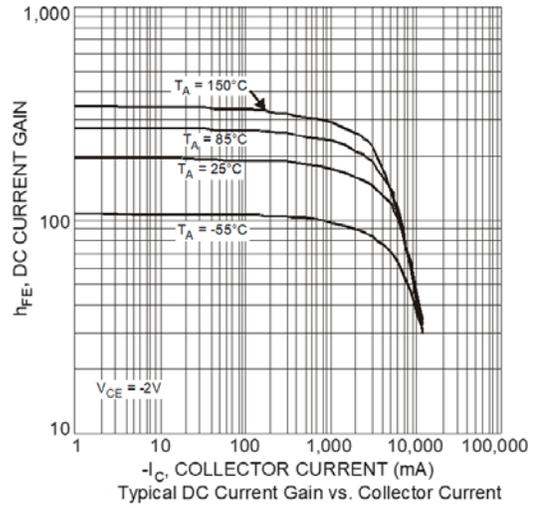
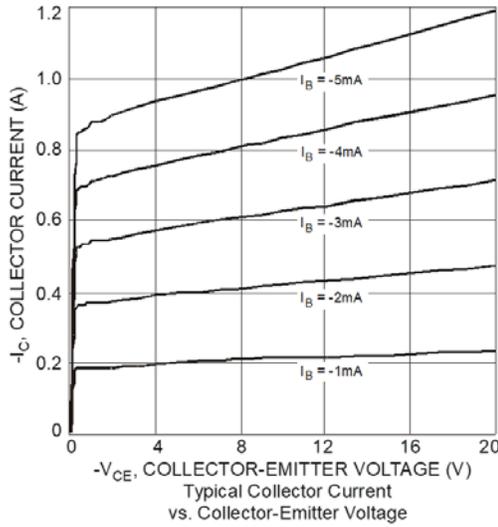


Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

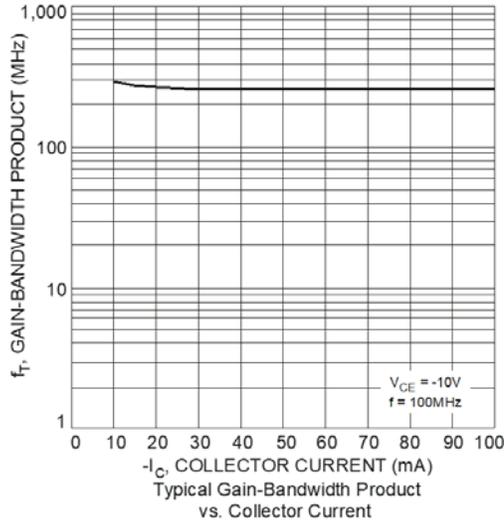
Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions
OFF CHARACTERISTICS						
Collector-Base Breakdown Voltage	V _{(BR)CBO}	-100	—	—	V	I _C = -100μA
Collector-Emitter Breakdown Voltage (Note 9)	V _{(BR)CEO}	-60	—	—	V	I _C = -10mA
Emitter-Base Breakdown Voltage	V _{(BR)EBO}	-7	—	—	V	I _E = -100μA
Collector-Base Cutoff Current	I _{CBO}	—	—	-100	nA	V _{CB} = -100V, I _E = 0
Emitter-Base Cutoff Current	I _{EBO}	—	—	-50	μA	V _{CB} = -100V, I _E = 0, T _A = 150°C
		—	—	-100	nA	V _{EB} = -6V, I _C = 0
ON CHARACTERISTICS (Note 9)						
DC Current Gain	h _{FE}	150	—	—	—	V _{CE} = -2V, I _C = -0.5A
		120	—	360		V _{CE} = -2V, I _C = -1A
		100	—	—		V _{CE} = -2V, I _C = -2A
		70	—	—		V _{CE} = -2V, I _C = -6A
Collector-Emitter Saturation Voltage	V _{CE(SAT)}	—	—	-50	mV	I _C = -0.1A, I _B = -2mA
		—	-50	-70		I _C = -1A, I _B = -100mA
		—	-90	-120		I _C = -2A, I _B = -200mA
		—	—	-250		I _C = -3A, I _B = -60mA
		—	—	-350		I _C = -6A, I _B = -600mA
Equivalent On-Resistance	R _{CE(SAT)}	—	45	60	mΩ	I _C = -2A, I _B = -200mA
Base-Emitter Saturation Voltage	V _{BE(SAT)}	—	—	-1.0	V	I _C = 1A, I _B = -100mA
Base-Emitter Turn-on Voltage	V _{BE(ON)}	—	—	-0.9	V	V _{CE} = -2V, I _C = -1A
SMALL SIGNAL CHARACTERISTICS						
Transition Frequency	f _T	100	—	—	MHz	V _{CE} = -10V, I _C = -100mA, f = 100MHz
Output Capacitance	C _{obo}	—	50	—	pF	V _{CB} = -10V, f = 1MHz
Input Capacitance	C _{ibo}	—	300	—	pF	V _{EB} = -5V, f = 1MHz
SWITCHING CHARACTERISTICS						
Turn-On Time	t _{on}	—	350	—	ns	V _{CC} = -30V, I _C = -750mA, I _{B1} = -15mA
Delay Time	t _d	—	180	—	ns	
Rise Time	t _r	—	170	—	ns	
Turn-Off Time	t _{off}	—	400	—	ns	V _{CC} = -30V, I _C = -750mA, I _{B1} = -I _{B2} = -15mA
Storage Time	t _s	—	300	—	ns	
Fall Time	t _f	—	100	—	ns	

Note: 9. Measured under pulsed conditions. Pulse width ≤ 300 μs. Duty cycle ≤ 2%

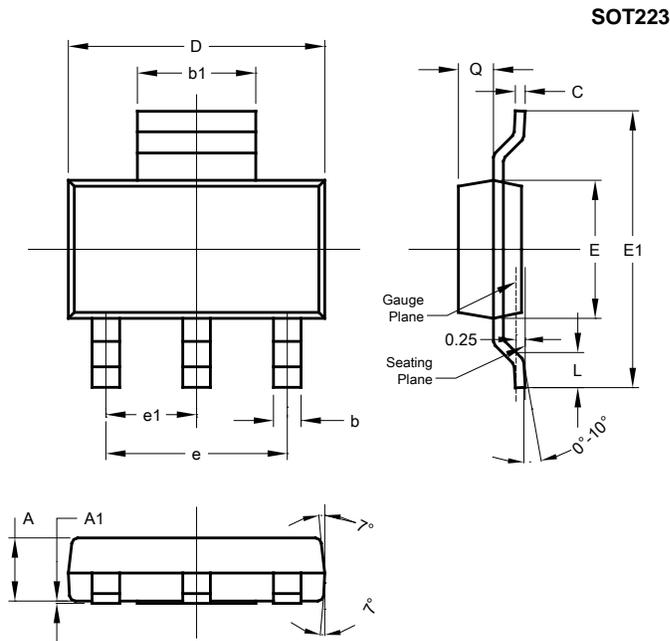
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



Typical Electrical Characteristics (continued)

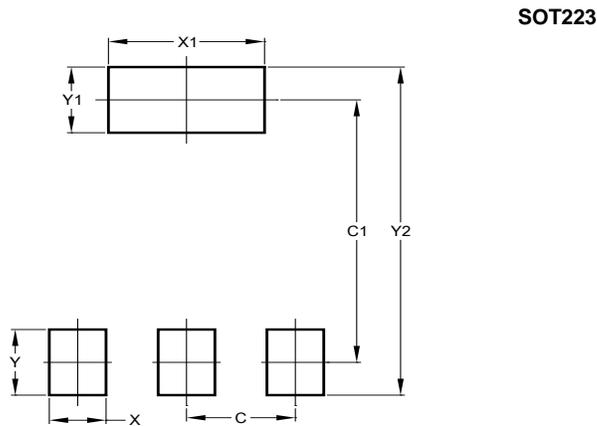


Package Outline Dimensions



SOT223			
Dim	Min	Max	Typ
A	1.55	1.65	1.60
A1	0.010	0.15	0.05
b	0.60	0.80	0.70
b1	2.90	3.10	3.00
C	0.20	0.30	0.25
D	6.45	6.55	6.50
E	3.45	3.55	3.50
E1	6.90	7.10	7.00
e	—	—	4.60
e1	—	—	2.30
L	0.85	1.05	0.95
Q	0.84	0.94	0.89
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
C	2.30
C1	6.40
X	1.20
X1	3.30
Y	1.60
Y1	1.60
Y2	8.00