



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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Features

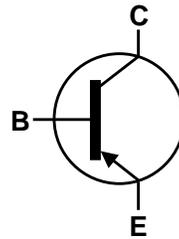
- $BV_{CEO} > -20V$
- $I_C = -2A$ Continuous Collector Current
- $I_{CM} = -4A$ Peak Pulse Current
- Low Saturation Voltage $V_{CE(sat)} < -120mV @ -1A$
- $R_{CE(sat)} = 40m\Omega$ for A Low Equivalent On-Resistance
- Complimentary NPN Type : DIODES™ NK-DSS20201L

Mechanical Data

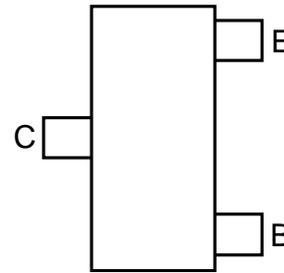
- Package: SOT23
- Package Material: Molded Plastic, "Green" Molding Compound
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads, Solderable per
MIL-STD-202, Method 208 ③
- Weight: 0.008 grams (Approximate)



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 _{CBO}	-20	V
Collector-Emitter Voltage	V _{CEO}	-20	V
Emitter-Base Voltage	V _{EBO}	-7	V
Peak Pulse Collector Current	I _{CM}	-4	A
Continuous Collector Current	I _C	-2	A

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

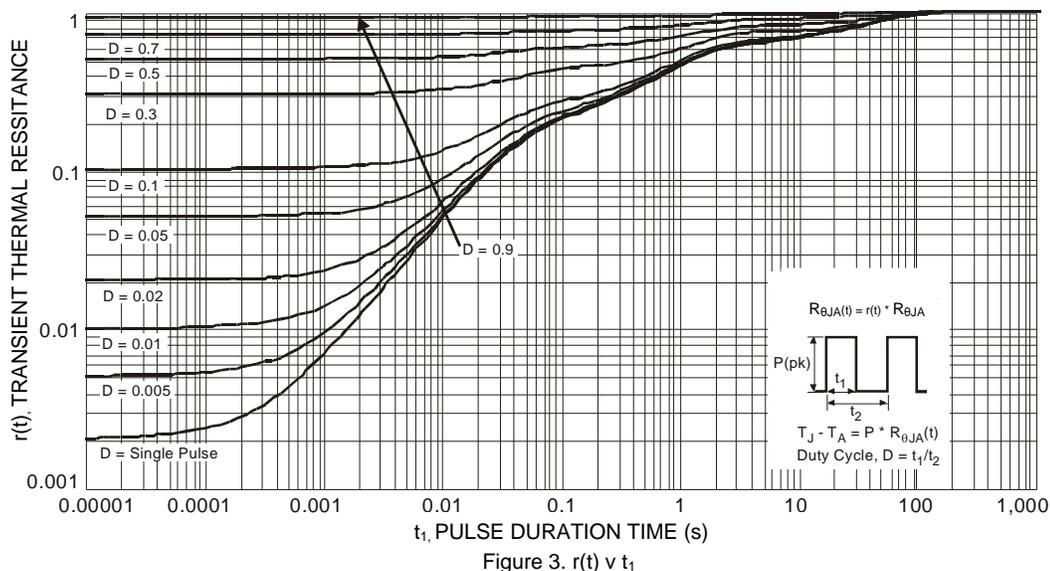
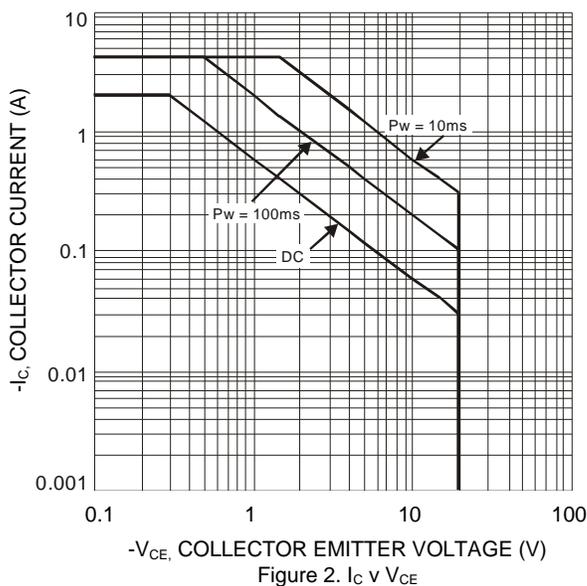
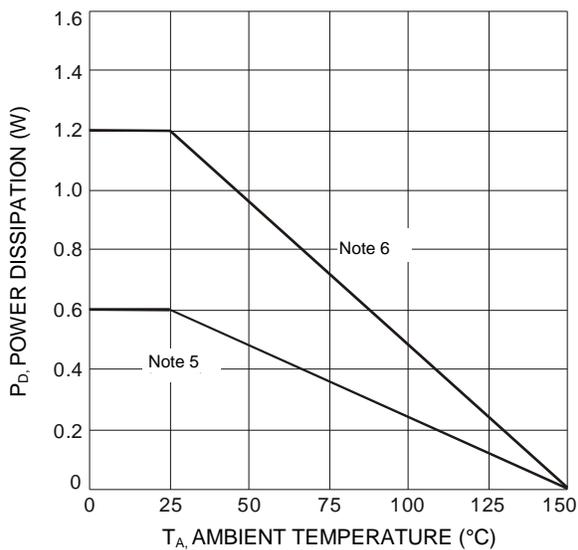
Characteristic	Symbol	Value	Unit
Power Dissipation	P _D	(Note 5) 600	mW
		(Note 6) 1200	
Thermal Resistance, Junction to Ambient Air	R _{θJA}	(Note 5) 209	°C/W
		(Note 6) 104	
Thermal Resistance, Junction to Leads	R _{θJL}	75	
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

ESD Ratings (Note 8)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

- Notes:
5. For a device mounted on minimum recommended pad layout with 1oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
 6. Same as note (5), except mounted on 25mm x 25mm 1oz copper.
 7. Thermal resistance from junction to solder-point (at the end of collector lead).
 8. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristics and Derating Information



Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions
OFF CHARACTERISTICS						
Collector-Base Breakdown Voltage	BV_{CBO}	-20	—	—	V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	-20	—	—	V	$I_C = -10\text{mA}$
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	—	—	V	$I_E = -100\mu\text{A}$
Collector-Base Cutoff Current	I_{CBO}	—	—	-100	nA	$V_{CB} = -20\text{V}, I_E = 0$
Emitter-Base Cutoff Current	I_{EBO}	—	—	-100	nA	$V_{EB} = -7\text{V}, I_C = 0$
ON CHARACTERISTICS (Note 9)						
DC Current Gain	h_{FE}	250	—	—	—	$V_{CE} = -2\text{V}, I_C = -10\text{mA}$
		250	—	—		$V_{CE} = -2\text{V}, I_C = -500\text{mA}$
		180	—	—		$V_{CE} = -2\text{V}, I_C = -1\text{A}$
		150	—	—		$V_{CE} = -2\text{V}, I_C = -2\text{A}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	—	—	-13	mV	$I_C = -0.1\text{A}, I_B = -10\text{mA}$
		—	-50	-90		$I_C = -1\text{A}, I_B = -100\text{mA}$
		—	-100	-120		$I_C = -1\text{A}, I_B = -10\text{mA}$
		—	-80	-180		$I_C = -2\text{A}, I_B = -200\text{mA}$
Equivalent On-Resistance	$R_{CE(sat)}$	—	40	90	m Ω	$I_C = -2\text{A}, I_B = -200\text{mA}$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	—	—	-0.9	V	$I_C = -1\text{A}, I_B = -10\text{mA}$
Base-Emitter Turn-on Voltage	$V_{BE(on)}$	—	—	-0.9	V	$V_{CE} = -2\text{V}, I_C = -1\text{A}$
SMALL SIGNAL CHARACTERISTICS						
Transition Frequency	f_T	100	—	—	MHz	$V_{CE} = -5\text{V}, I_C = -100\text{mA}, f = 100\text{MHz}$
Output Capacitance	C_{obo}	—	—	100	pF	$V_{CB} = -3\text{V}, f = 1\text{MHz}$
Input Capacitance	C_{ibo}	—	—	330	pF	$V_{EB} = -0.5\text{V}, f = 1\text{MHz}$
SWITCHING CHARACTERISTICS						
Turn-On Time	t_{on}	—	—	180	ns	$V_{CC} = -15\text{V}, I_C = -750\text{mA}, I_{B1} = -15\text{mA}$
Delay Time	t_d	—	—	60	ns	
Rise Time	t_r	—	—	120	ns	
Turn-Off Time	t_{off}	—	—	430	ns	$V_{CC} = -15\text{V}, I_C = -750\text{mA}, I_{B1} = -I_{B2} = -15\text{mA}$
Storage Time	t_s	—	—	300	ns	
Fall Time	t_f	—	—	130	ns	

 Note: 9. Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$.

Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

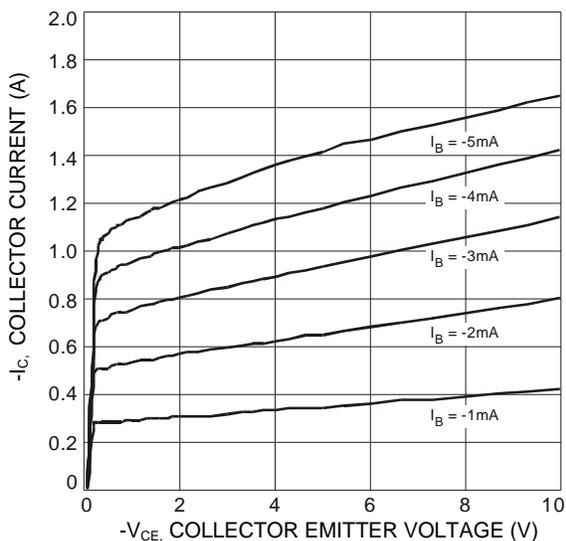


Figure 4. I_C v V_{CE}

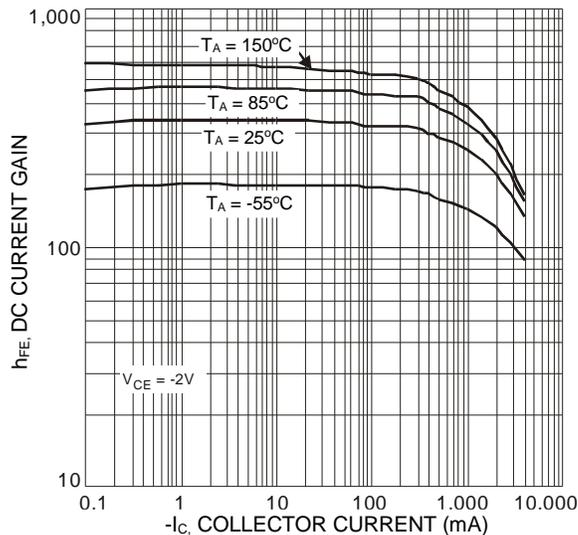


Figure 5. h_{FE} v I_C

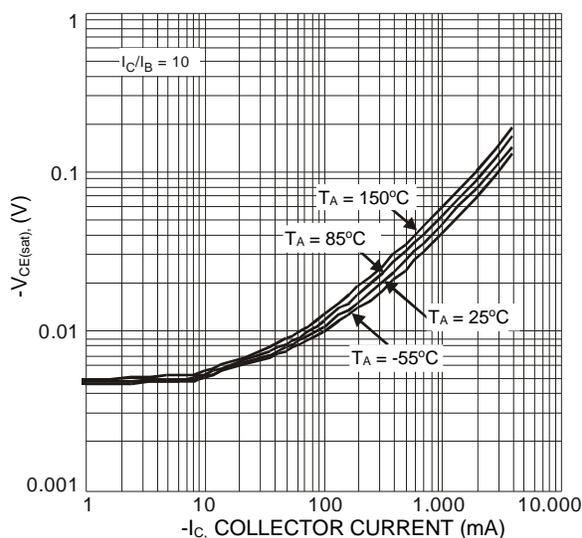


Figure 6. $V_{CE(sat)}$ v I_C

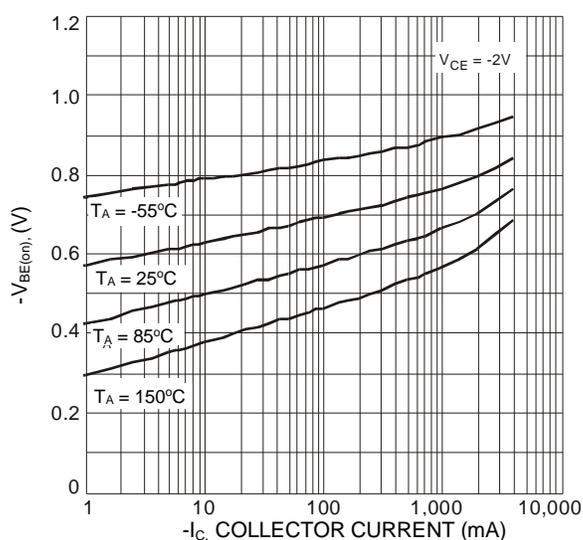


Figure 7. $V_{BE(on)}$ v I_C

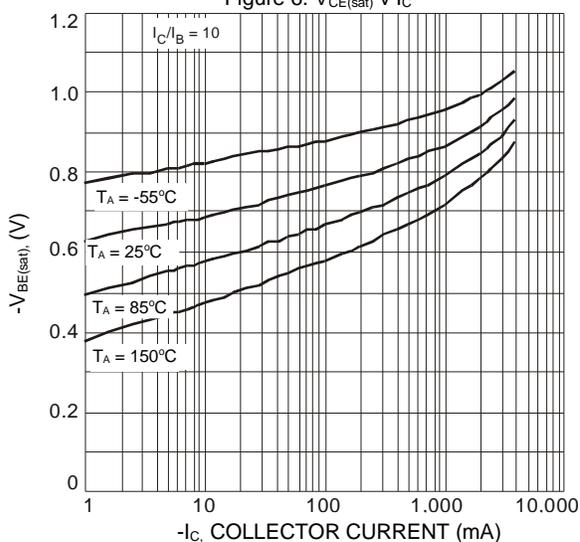


Figure 8. $V_{BE(sat)}$ v I_C

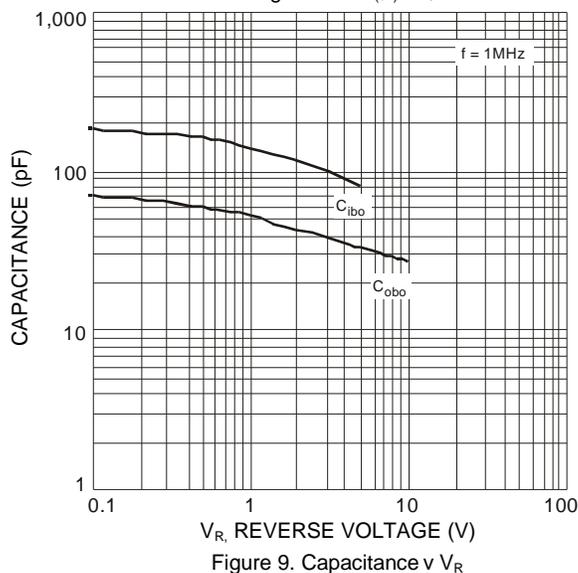


Figure 9. Capacitance v V_R

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

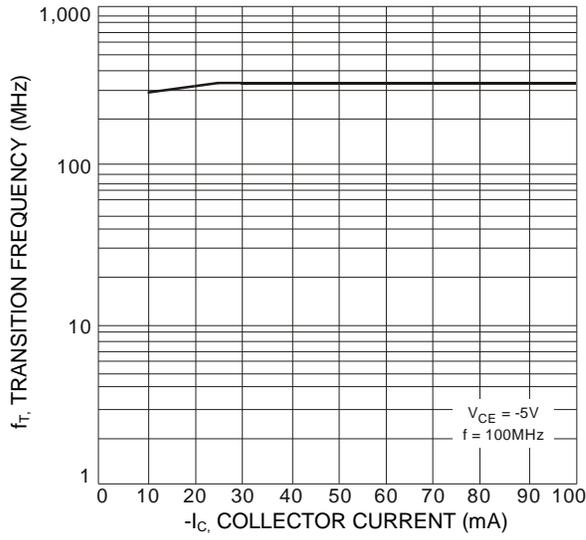
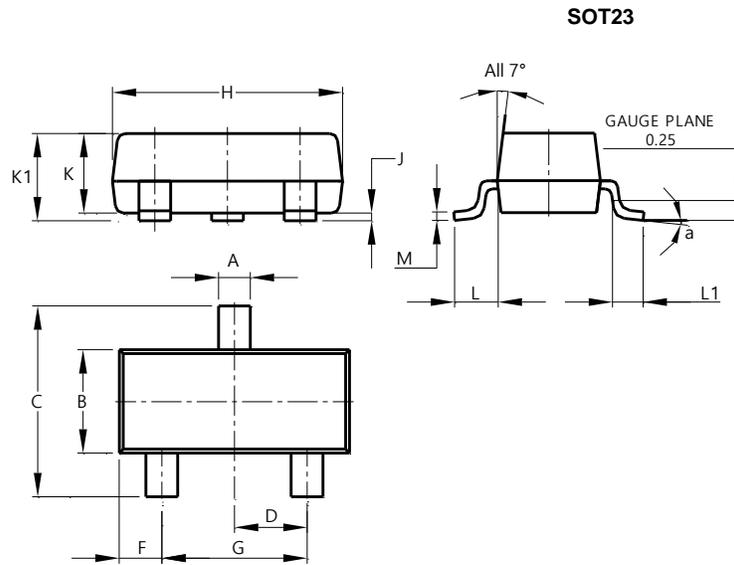


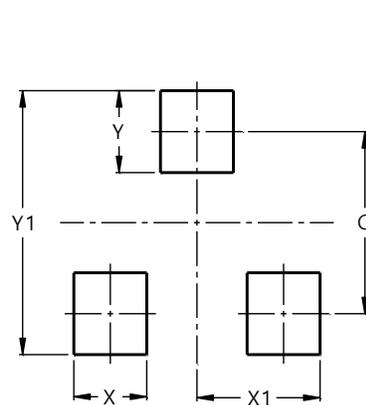
Figure 10. f_T v I_C

Package Outline Dimensions



SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
C	2.0
X	0.8
X1	1.35
Y	0.9
Y1	2.9