优尚

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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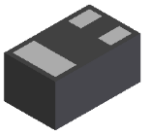
Features

- BV_{CEO} > -40V
- I_C = -500mA High Collector Current
- I_{CM} = -1A Peak Pulse Current
- P_D = 1000mW Power Dissipation
- Low Collector-Emitter Saturation Voltage, $V_{CE(sat)}$
- 0.60mm^2 Package Footprint, 13 Times Smaller than SOT23
- 0.5mm Height Package Minimizing Off-Board Profile
- Complementary NPN Type DIODES™ NK-DSS2540M

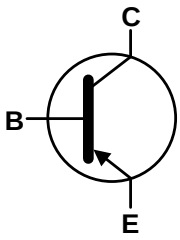
Mechanical Data

- Package: X1-DFN1006-3
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – NiPdAu Solderable per MIL-STD-202, Method 208 e4
- Weight: 0.0009 grams (Approximate)

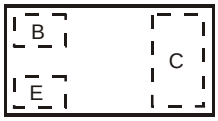
X1-DFN1006-3



Bottom View



Device Symbol



Top View
Device Schematic

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	-40	V
Collector-Emitter Voltage	V_{CEO}	-40	V
Emitter-Base Voltage	V_{EBO}	-6	V
Collector Current - Continuous	I_C	-500	mA
Peak Pulse Collector Current	I_{CM}	-1	A
Peak Base Current	I_{BM}	-100	mA

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

Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P_D	400	mW
	(Note 6)		1000	
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	310	°C/W
	(Note 6)		120	
Thermal Resistance, Junction to Lead	(Note 7)	$R_{\theta JL}$	120	°C/W
Operating and Storage and 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	B

Notes:
5. For the device mounted on minimum recommended pad layout 2oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in steady state condition.
6. Same as Note 5, except the exposed collector pad is mounted on 25mm x 25mm 2oz copper.
7. Thermal resistance from junction to solder-point (on the exposed collector pad).
8. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristics

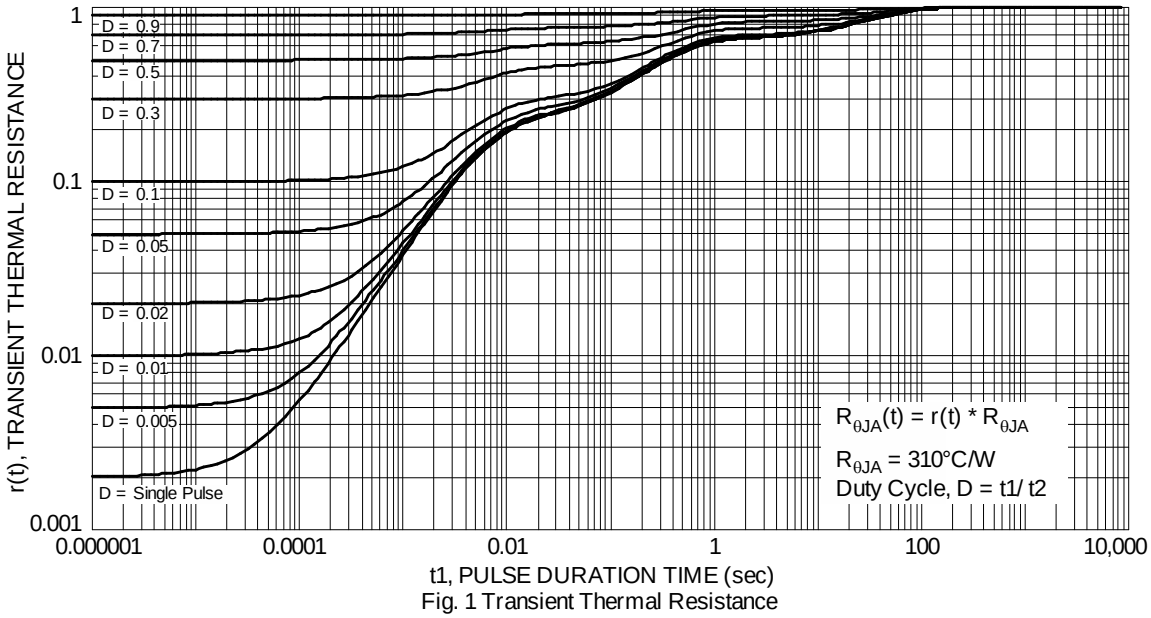


Fig. 1 Transient Thermal Resistance

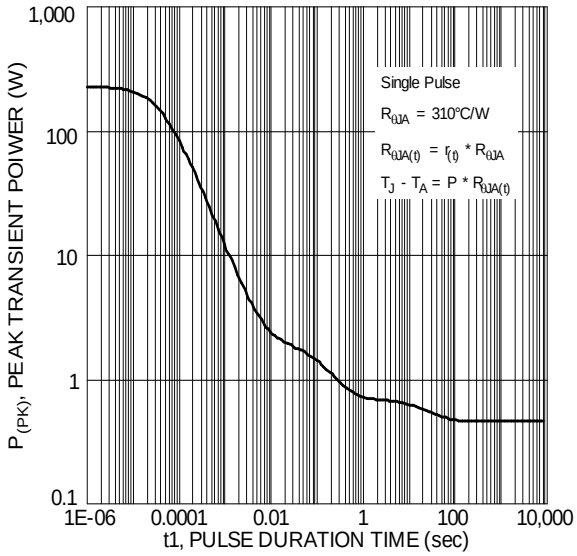


Fig. 2 Single Pulse Maximum Power Dissipation

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Collector-Base Breakdown Voltage	BV_{CBO}	-40	—	—	V	I_C = -100μA, I_E = 0
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	-40	—	—	V	I_C = -10mA, I_B = 0
Emitter-Base Breakdown Voltage	BV_{EBO}	-6	—	—	V	I_E = -100μA, I_C = 0
Collector-Base Cutoff Current	I_{CBO}	— —	— —	-100 -50	nA μA	V_{CB} = -30V, I_E = 0 V_{CB} = -30V, I_E = 0, T_A = +150°C
Emitter-Base Cutoff Current	I_{EBO}	—	—	-100	nA	V_{EB} = -5V, I_C = 0
Collector-Emitter Cutoff Current	I_{CEX}	—	—	-100	nA	V_{CE} = -30V, V_X = ±0.25V
				-100		V_{CE} = -30V, V_X = 3V
Collector-Emitter Cutoff Current	I_{CES}	—	—	-100	nA	V_{CE} = -30V
ON CHARACTERISTICS (Note 9)						
DC Current Gain	h_{FE}	200 150 40	— — —	— — —	—	V_{CE} = -2V, I_C = -10mA V_{CE} = -2V, I_C = -100mA V_{CE} = -2V, I_C = -500mA
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	— — — —	— — — —	-50 -130 -200 -350	mV	I_C = -10mA, I_B = -0.5mA I_C = -100mA, I_B = -5mA I_C = -200mA, I_B = -10mA I_C = -500mA, I_B = -50mA
Collector-Emitter Saturation Resistance	$R_{CE(sat)}$	—	—	700	mΩ	I_C = -500mA, I_B = -50mA
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	—	—	-1.2	V	I_C = -500mA, I_B = -50mA
Base-Emitter Turn On Voltage	$V_{BE(on)}$	—	—	-1.1	V	V_{CE} = -2V, I_C = -100mA
SMALL SIGNAL CHARACTERISTICS						
Output Capacitance	C_{obo}	—	—	10	pF	V_{CB} = -10V, f = 1.0MHz
Current Gain-Bandwidth Product	f_T	100	—	—	MHz	V_{CE} = -5V, I_C = -100mA, f = 100MHz

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

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

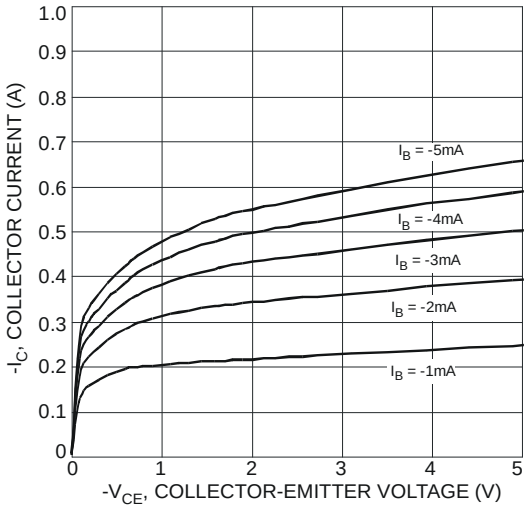


Fig. 3 Typical Collector Current vs. Collector-Emitter Voltage

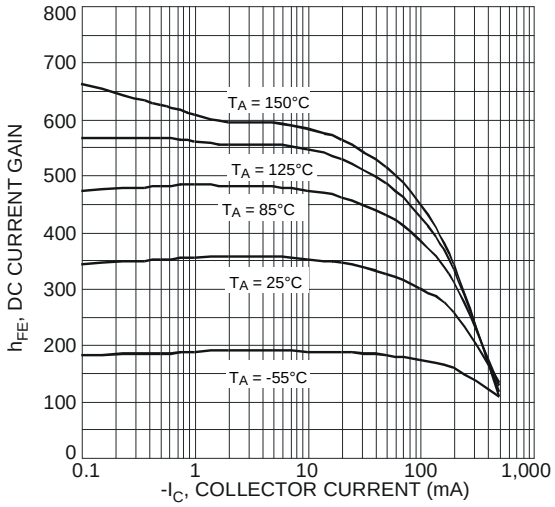


Fig. 4 Typical DC Current Gain vs. Collector Current

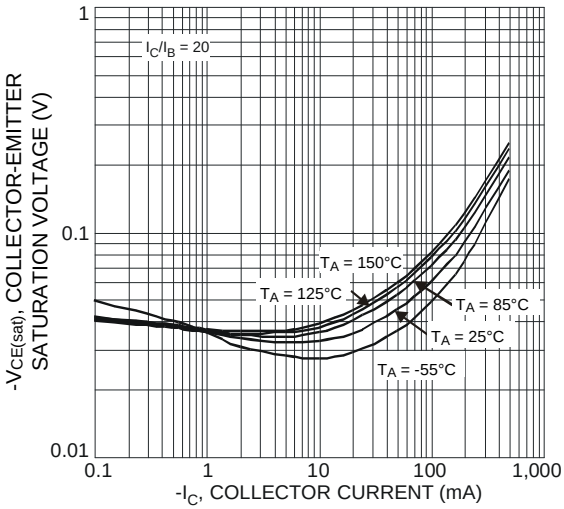


Fig. 5 Typical Collector-Emitter Saturation Voltage vs. Collector Current

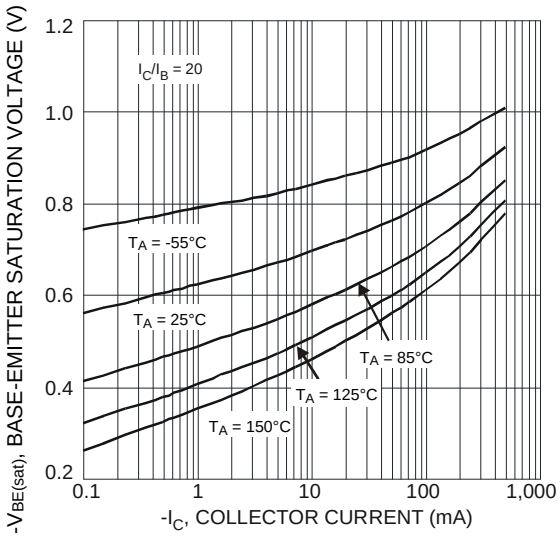


Fig. 6 Typical Base-Emitter Saturation Voltage vs. Collector Current

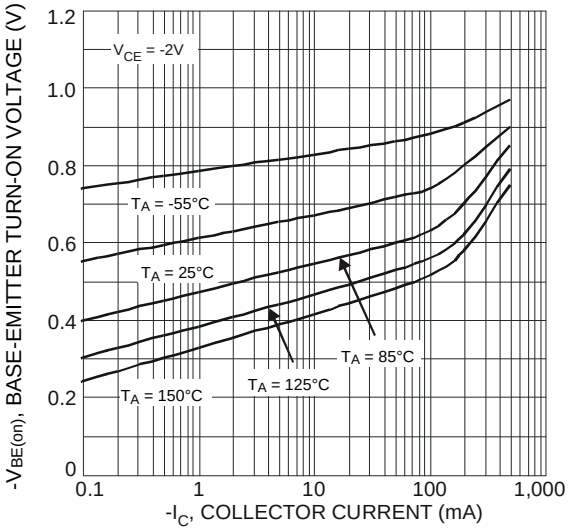


Fig. 7 Typical Base-Emitter Turn-On Voltage vs. Collector Current

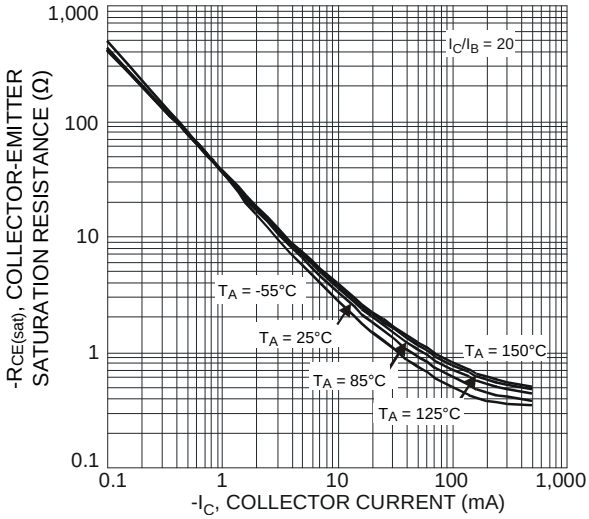
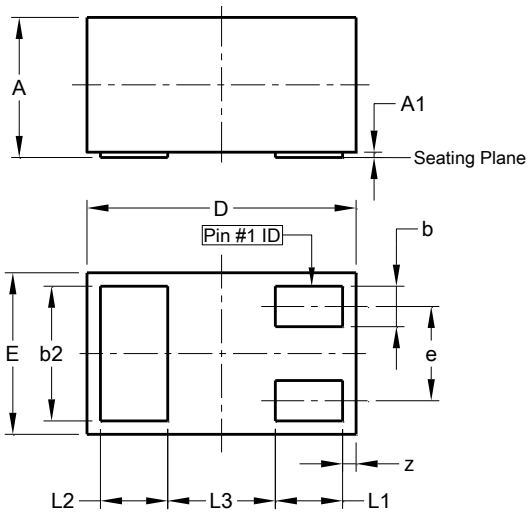


Fig. 8 Typical Collector-Emitter Saturation Resistance vs. Collector Current

Package Outline Dimensions

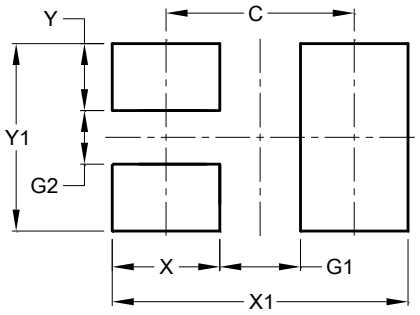
X1-DFN1006-3



X1-DFN1006-3			
Dim	**Min**	**Max**	**Typ**
A	0.47	0.53	0.50
A1	0.00	0.05	0.03
b	0.10	0.20	0.15
b2	0.45	0.55	0.50
D	0.95	1.075	1.00
E	0.55	0.675	0.60
e	-	-	0.35
L1	0.20	0.30	0.25
L2	0.20	0.30	0.25
L3	-	-	0.40
z	0.02	0.08	0.05
All Dimensions in mm			

Suggested Pad Layout

X1-DFN1006-3



Dimensions	Value (in mm)
C	0.70
G1	0.30
G2	0.20
X	0.40
X1	1.10
Y	0.25
Y1	0.70