



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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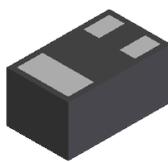
Features

- $BV_{CEO} > -15V$
- $I_C = -500mA$ 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-DSS2515M

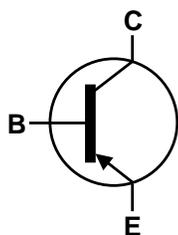
Mechanical Data

- 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 
- Weight: 0.0009 grams (Approximate)

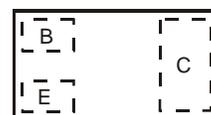
X1-DFN1006-3



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}	-15	V
Collector-Emitter Voltage	V _{CEO}	-15	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.)

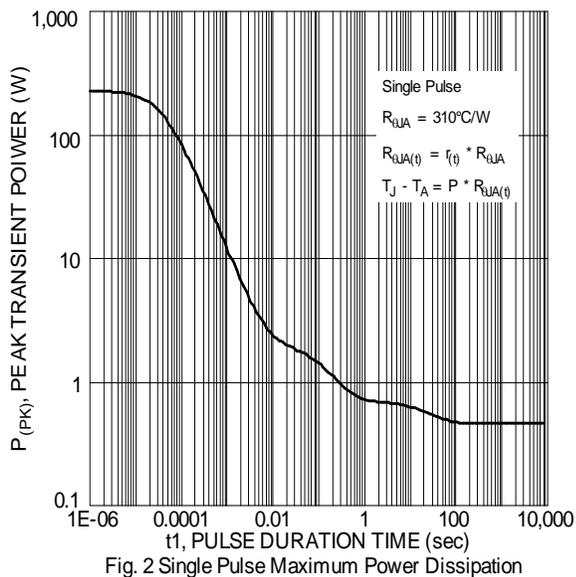
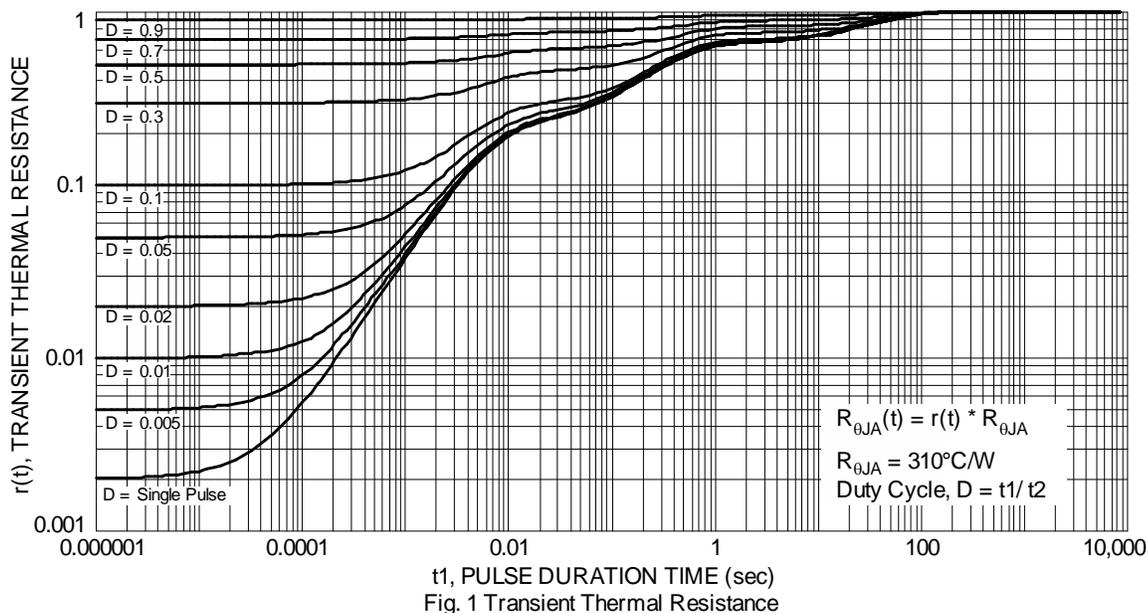
Characteristic	Symbol	Value	Unit
Power Dissipation	P _D	(Note 5)	400
		(Note 6)	1000
Thermal Resistance, Junction to Ambient	R _{θJA}	(Note 5)	310
		(Note 6)	120
Thermal Resistance, Junction to Lead	R _{θJL}	120	°C/W
Operating and Storage and Temperature Range	T _J , T _{STG}	-55 to +150	°C

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	200	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



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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Collector-Base Breakdown Voltage	BV_{CB0}	-15	—	—	V	$I_C = -100\mu\text{A}, I_E = 0$
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	-15	—	—	V	$I_C = -10\text{mA}, I_B = 0$
Emitter-Base Breakdown Voltage	BV_{EBO}	-6	—	—	V	$I_E = -100\mu\text{A}, I_C = 0$
Collector Cutoff Current	I_{CBO}	—	—	-100 -50	nA μA	$V_{CB} = -15\text{V}, I_E = 0$ $V_{CB} = -15\text{V}, I_E = 0, T_A = +150^\circ\text{C}$
Emitter Cutoff Current	I_{EBO}	—	—	-100	nA	$V_{EB} = -5\text{V}, I_C = 0$
ON CHARACTERISTICS (Note 9)						
DC Current Gain	h_{FE}	200 150 90	— — —	— — —	—	$V_{CE} = -2\text{V}, I_C = -10\text{mA}$ $V_{CE} = -2\text{V}, I_C = -100\text{mA}$ $V_{CE} = -2\text{V}, I_C = -500\text{mA}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	— — —	— — —	-25 -150 -250	mV	$I_C = -10\text{mA}, I_B = -0.5\text{mA}$ $I_C = -200\text{mA}, I_B = -10\text{mA}$ $I_C = -500\text{mA}, I_B = -50\text{mA}$
Collector-Emitter Saturation Resistance	$R_{CE(sat)}$	—	—	500	$\text{m}\Omega$	$I_C = -500\text{mA}, I_B = -50\text{mA}$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	—	—	-1.1	V	$I_C = -500\text{mA}, I_B = -50\text{mA}$
Base-Emitter Turn On Voltage	$V_{BE(on)}$	—	—	-0.9	V	$V_{CE} = -2\text{V}, I_C = -100\text{mA}$
SMALL SIGNAL CHARACTERISTICS						
Output Capacitance	C_{obo}	—	—	10	pF	$V_{CB} = -10\text{V}, f = 1.0\text{MHz}$
Current Gain-Bandwidth Product	f_T	100	340	—	MHz	$V_{CE} = -5\text{V}, I_C = -100\text{mA}, f = 100\text{MHz}$

 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.)

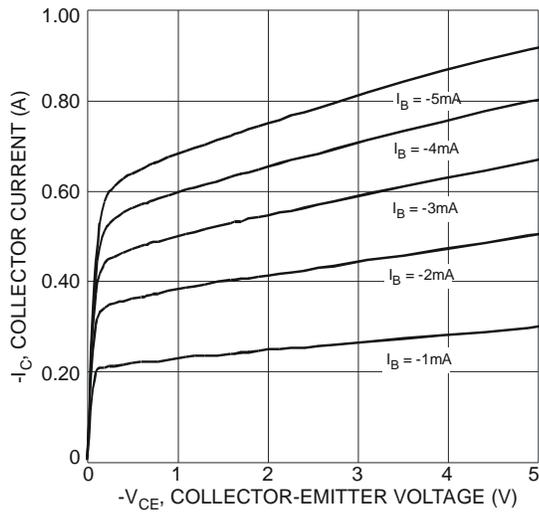


Fig. 3 Typical Collector Current vs. Collector-Emitter Voltage

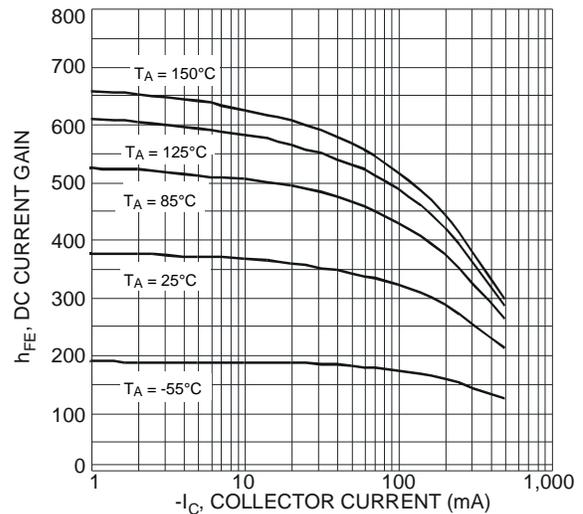


Fig. 4 Typical DC Current Gain vs. Collector Current

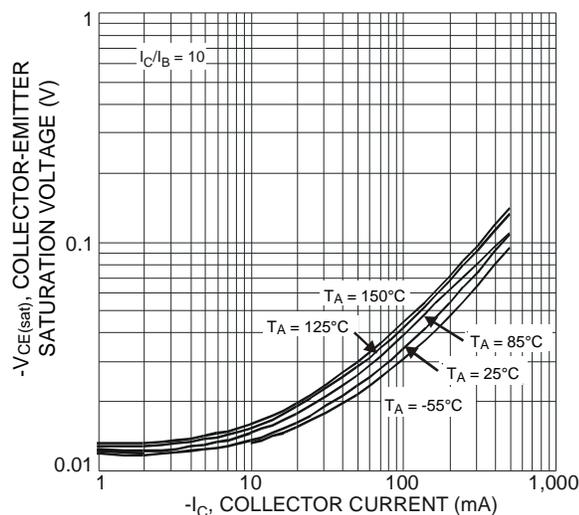


Fig. 5 Typical Collector-Emitter Saturation Voltage vs. Collector Current

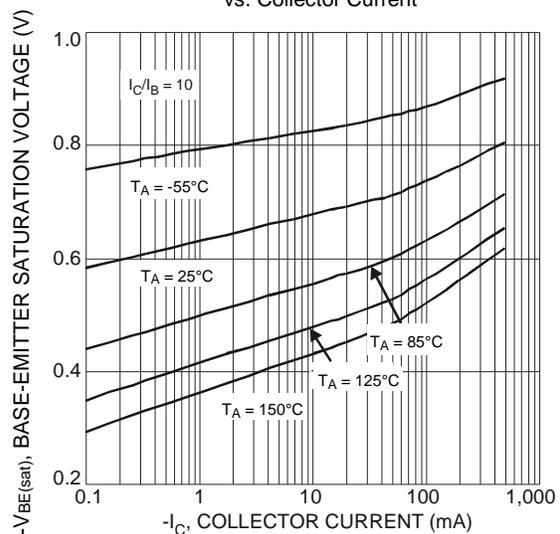


Fig. 6 Typical Base-Emitter Saturation Voltage vs. Collector Current

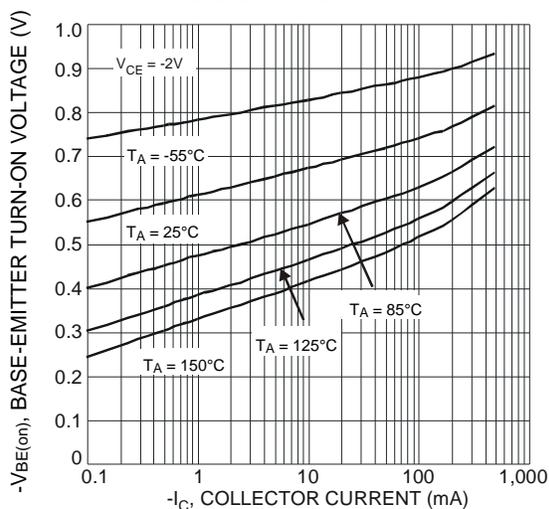


Fig. 7 Typical Base-Emitter Turn-On Voltage vs. Collector Current

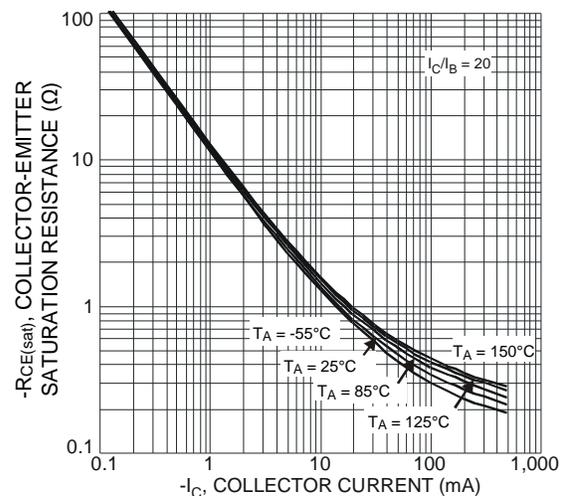
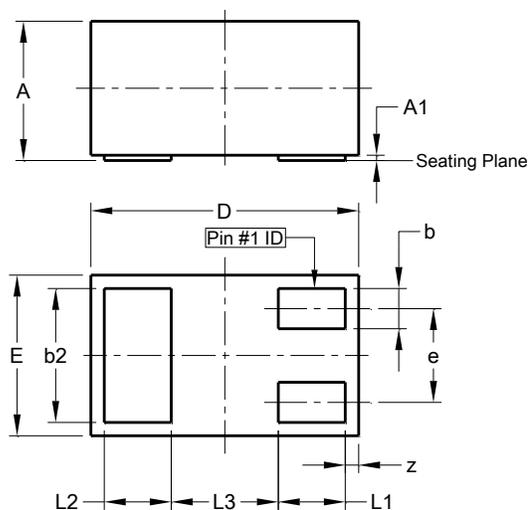


Fig. 8 Typical Collector-Emitter Saturation Resistance vs. Collector Current

Package Outline Dimensions

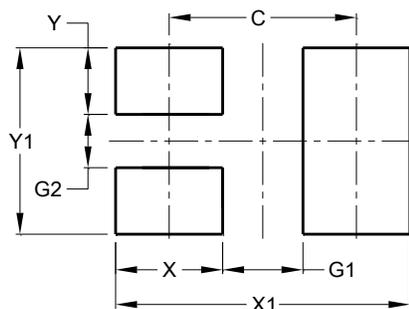
X1-DFN1006-3



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