



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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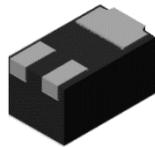
Features

- $BV_{CEO} > -45V$
- $I_C = -100mA$ High Collector Current
- $P_D = 1W$ Power Dissipation
- $0.6mm^2$ Package Footprint, 13 Times Smaller than SOT23
- 0.4mm-High Package Minimizing Off-Board Profile
- Sidewall Tin Plating for Wettable Flanks in AOI

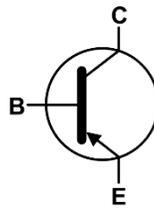
Mechanical Data

- Package: U-DFN1006-3/SWP (Type UX)
- 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 
- Weight: 0.0008 grams (Approximate)

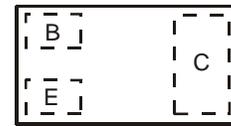
U-DFN1006-3/SWP
(Type UX)



Bottom View



Device Symbol



Top View
Device Schematic

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CB0}	-50	V
Collector-Emitter Voltage	V_{CEO}	-45	V
Emitter-Base Voltage	V_{EB0}	-6	V
Collector Current	I_C	-100	mA
Peak Pulse Collector Current	I_{CM}	-200	mA

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

Characteristic	Symbol	Value	Unit
Power Dissipation	P_D	(Note 5) 0.255	W
		(Note 6) 0.890	
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	(Note 5) 490	$^\circ\text{C/W}$
		(Note 6) 140	
Thermal Resistance, Junction to Lead	$R_{\theta JL}$	42	$^\circ\text{C/W}$
Operating and Storage and Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

ESD Ratings (Note 8)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge – Human Body Model	ESD HBM	4000	V	3A

- Notes:
5. For a device mounted on the minimum recommended pad layout of 2oz copper 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 JS-001.

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

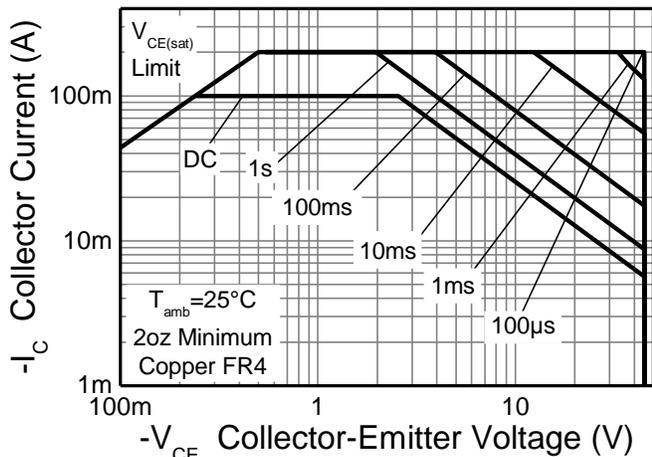


Fig. 1 Safe Operating Area

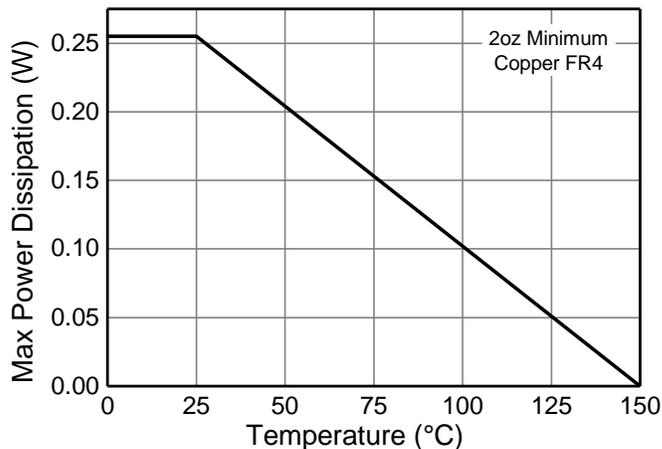


Fig.2 Derating Curve

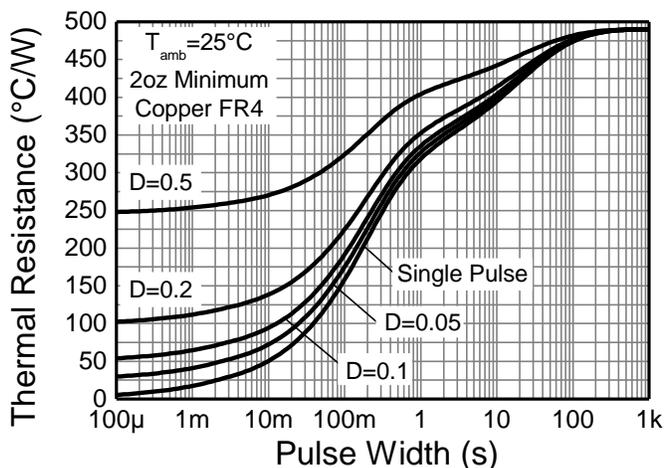


Fig.3 Transient Thermal Impedance

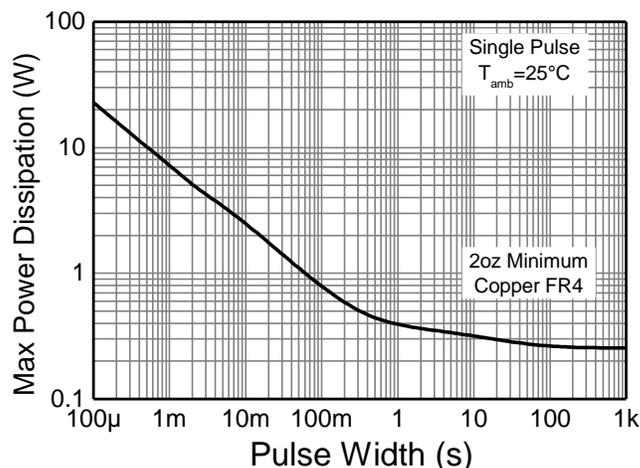


Fig.4 Pulse Power Dissipation

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-50	—	—	V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	-45	—	—	V	$I_C = -10\text{mA}$
Emitter-Base Breakdown Voltage	BV_{EBO}	-5	—	—	V	$I_E = -100\mu\text{A}$
DC Current Gain	h_{FE}	220	300	475	—	$V_{CE} = -5\text{V}$, $I_C = -2\text{mA}$
Collector-Emitter Saturation Voltage (Note 9)	$V_{CE(sat)}$	—	-90 -250	-300 -650	mV	$I_C = -10\text{mA}$, $I_B = -0.5\text{mA}$ $I_C = -100\text{mA}$, $I_B = -5\text{mA}$
Base-Emitter Saturation Voltage (Note 9)	$V_{BE(sat)}$	—	-700 -850	—	mV	$I_C = -10\text{mA}$, $I_B = -0.5\text{mA}$ $I_C = -100\text{mA}$, $I_B = -5\text{mA}$
Base-Emitter Voltage (Note 9)	$V_{BE(on)}$	-600 —	-670 -710	-750 -820	mV	$V_{CE} = -5\text{V}$, $I_C = -2\text{mA}$ $V_{CE} = -5\text{V}$, $I_C = -10\text{mA}$
Collector-Cutoff Current	I_{CBO}	— —	— —	-15 -4.0	nA μA	$V_{CB} = -30\text{V}$ $V_{CB} = -30\text{V}$, $T_A = +150^\circ\text{C}$
Gain Bandwidth Product	f_T	100	—	—	MHz	$V_{CE} = -5\text{V}$, $I_C = -10\text{mA}$ $f = 100\text{MHz}$
Collector-Base Capacitance	C_{CBO}	—	3.0	—	pF	$V_{CB} = -10\text{V}$, $f = 1\text{MHz}$

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.)

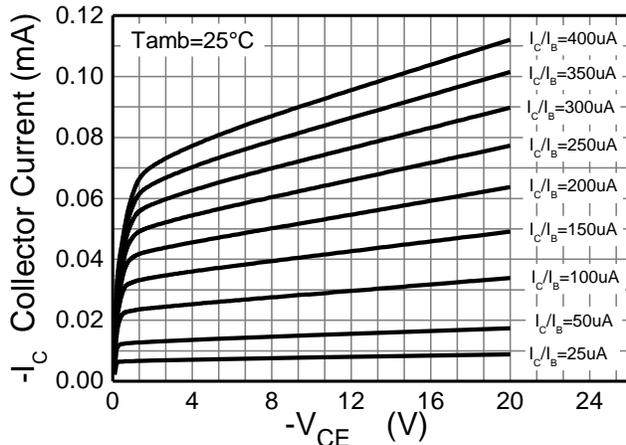


Fig.5 $I_C \ v \ V_{CE}$

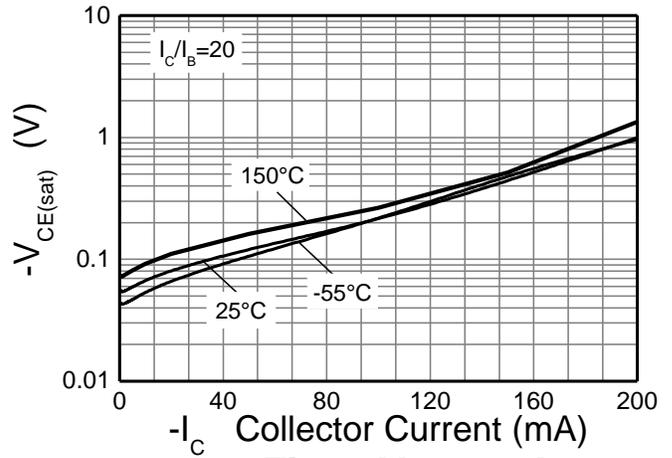


Fig.6 $V_{CE(sat)} \ v \ I_C$

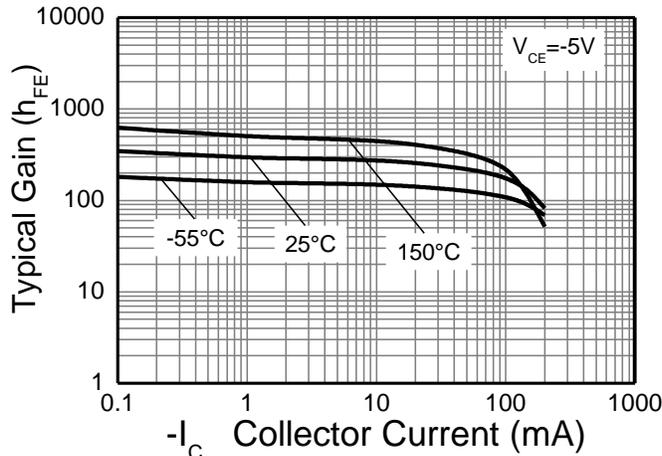


Fig.7 $h_{FE} \ v \ I_C$

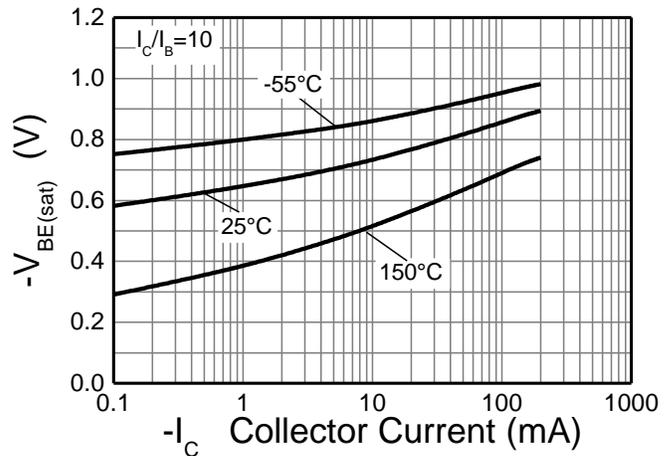


Fig.8 $V_{BE(sat)} \ v \ I_C$

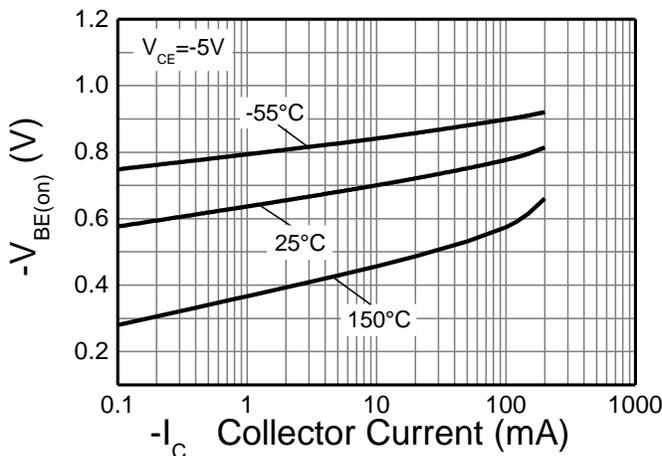
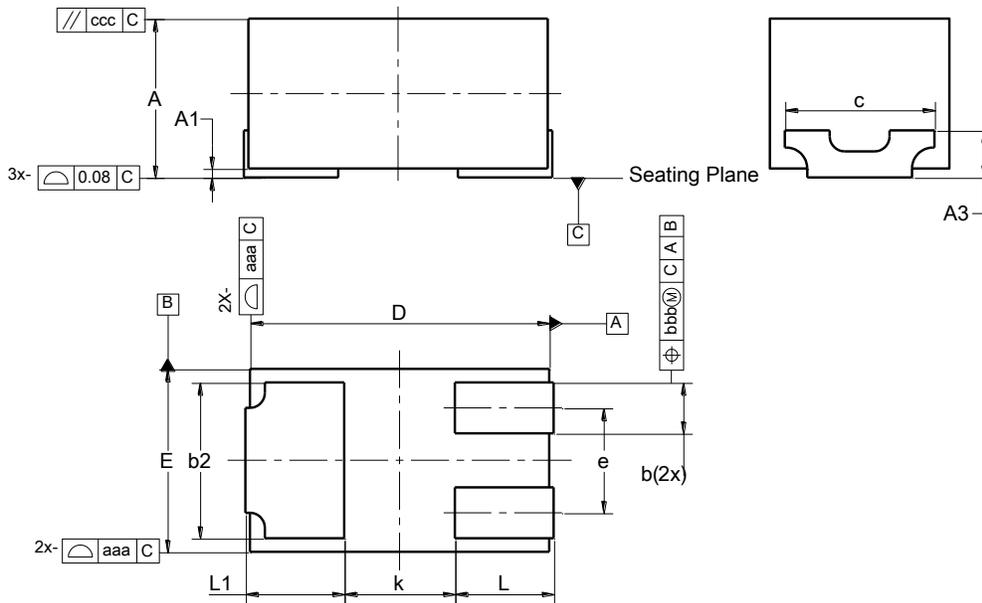


Fig. 9 $V_{BE(on)} \ v \ I_C$

Package Outline Dimensions

U-DFN1006-3/SWP (Type UX)

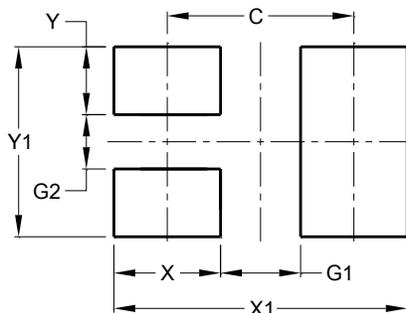


U-DFN1006-3/SWP (Type UX)			
Dim	Min	Max	Typ
A	0.47	0.53	0.50
A1	0.00	0.05	0.03
A3	0.17 REF		
b	0.12	0.22	0.17
b2	0.47	0.57	0.52
D	0.95	1.05	1.00
E	0.55	0.65	0.60
e	--	--	0.35
k	0.37 REF		
L	0.28	0.38	0.33
L1	0.28	0.38	0.33
c	0.50 REF		
aaa	0.15		
bbb	0.05		
ccc	0.05		
All Dimensions in mm			

Note: 10. Sidewall tin-plated package for wettable flanks in AOI.

Suggested Pad Layout

U-DFN1006-3/SWP (Type UX)



Dimensions	Value (in mm)
C	0.700
G1	0.300
G2	0.200
X	0.400
X1	1.100
Y	0.250
Y1	0.700