



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

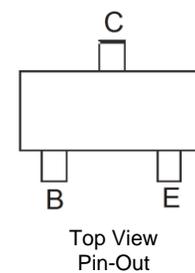
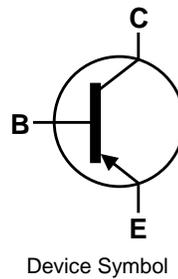
- $BV_{CEO} > -40V$
- $BV_{ECO} > -3V$
- $I_C = -3A$ Continuous Collector Current
- $V_{CE(sat)} < -85mV @ -1A$
- $R_{CE(sat)} = 55m\Omega$ typical
- $P_D = 1.25W$
- High Power Dissipation SOT23 Package
- High Peak Current
- Low Saturation Voltage
- 3V Reverse Blocking Voltage
- Complementary Part Number: NK-ZXTN25040DFH

Mechanical Data

- Case: SOT23
- Case 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: 0.008 grams (Approximate)

Applications

- MOSFET and IGBT gate driving
- DC-DC converters
- Motor drives
- High-side drivers



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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CB0}	-45	V
Collector-Emitter Voltage (Forward Blocking)	V_{CEO}	-40	V
Emitter-collector voltage (Reverse Blocking)	V_{ECO}	-3	V
Emitter-Base Voltage	V_{EBO}	-7	V
Continuous Collector Current	I_C	-3	A
Peak Pulse Current	I_{CM}	-9	A

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

Characteristic	Symbol	Value	Unit
Power Dissipation Linear derating factor	P_D	0.73	W mW/°C
		5.84	
		0.78	
		6.24	
		1.05	
		8.4	
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	1.25	°C/W
		9.6	
		1.81	
		14.5	
		171	
Thermal Resistance, Junction to Lead	$R_{\theta JL}$	160	°C/W
		119	
		100	
		69	
Thermal Resistance, Junction to Case	$R_{\theta JC}$	74.95	°C/W
Thermal Resistance, Junction to Case	$R_{\theta JC}$	45	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

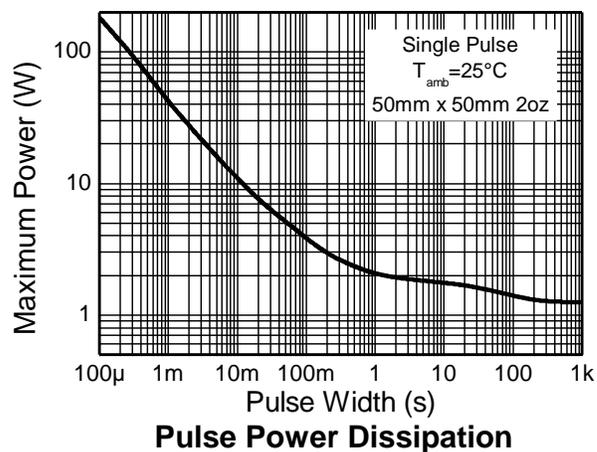
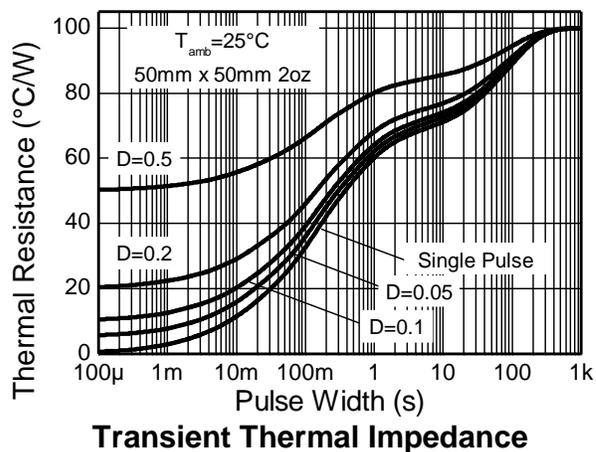
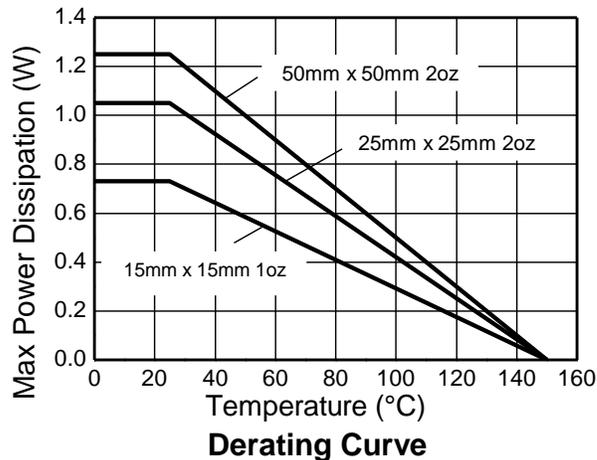
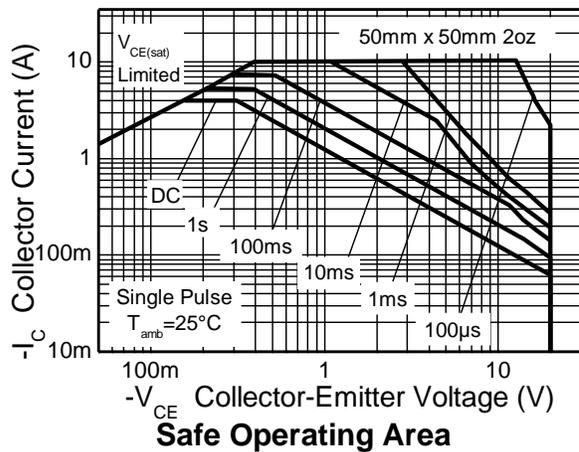
- Notes:
5. For a device surface mounted on 15mm x 15mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
 6. Same as note (5), except the device is mounted on FR4 substrate PCB layout with minimum recommended pad layout.
 7. Same as note (5), except the device is surface mounted on 25mm x 25mm with 2 oz copper.
 8. Same as note (5), except the device is surface mounted on 50mm x 50mm with 2 oz copper.
 9. Same as note (8), except the device is measured at $t < 5\text{secs}$.
 10. Thermal resistance from junction to solder-point (at the end of the collector lead).
 11. Thermal resistance from junction to the top of the case.

ESD Ratings (Note 12)

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

- Note: 12. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristics and Derating Information

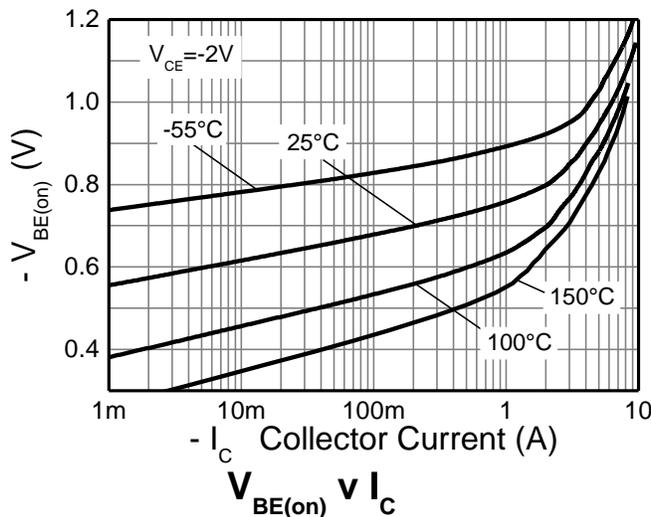
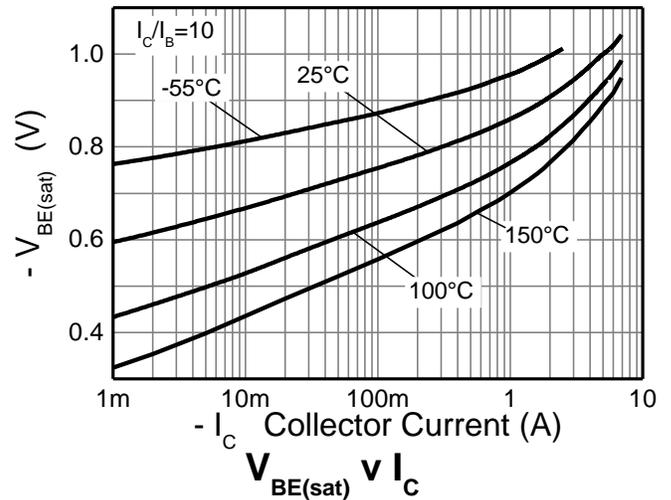
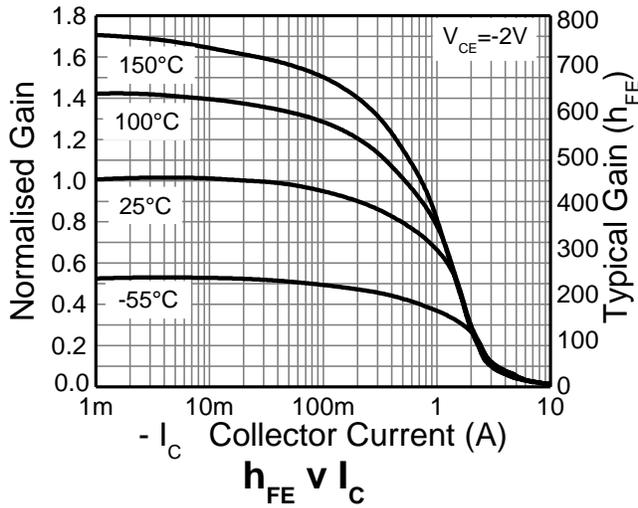
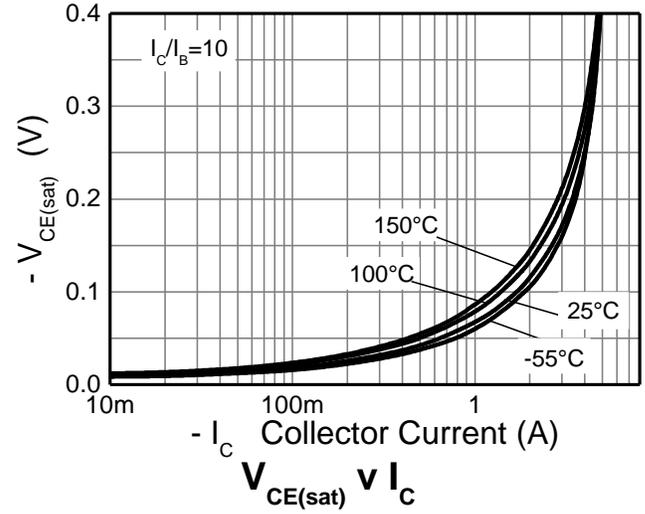
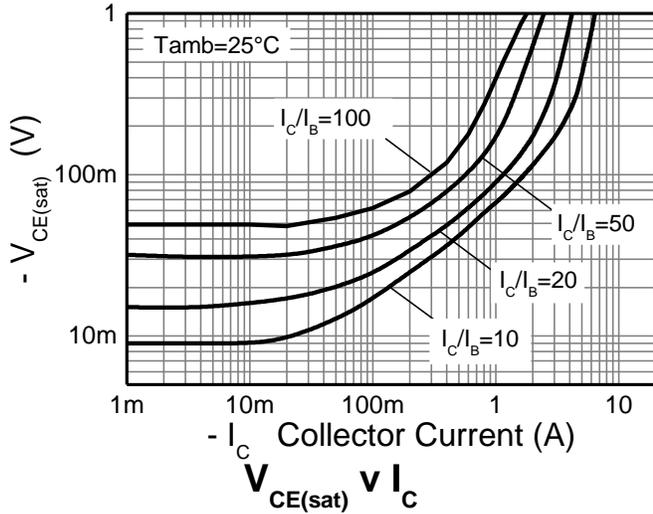


Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

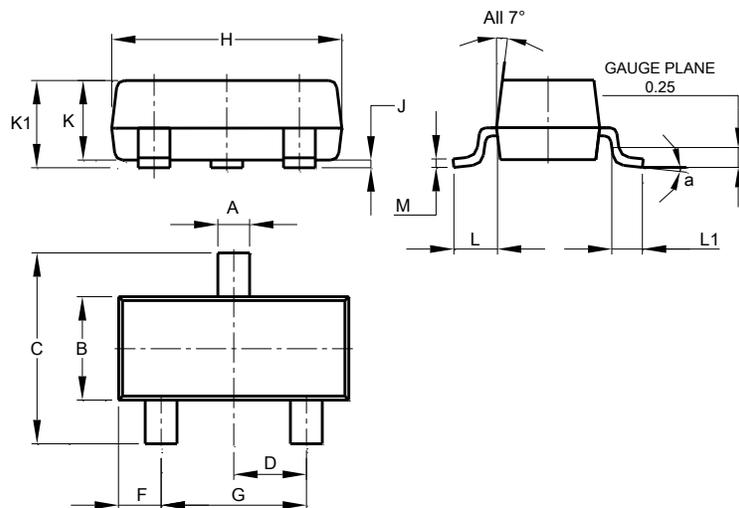
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-45	-75	-	V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 13)	BV_{CEO}	-40	-65	-	V	$I_C = -10\text{mA}$
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	-8.2	-	V	$I_E = -100\mu\text{A}$
Emitter-Collector Breakdown Voltage	BV_{ECO}	-3	-8.7	-	V	$I_E = -100\mu\text{A}$
Collector-Base Cutoff Current	I_{CBO}	-	< -1	-50	nA	$V_{CB} = -45\text{V}$
		-	-	-0.5	μA	$V_{CB} = -45\text{V}, T_{amb} = +100^\circ\text{C}$
Emitter-Base Cutoff Current	I_{EBO}	-	< -1	-50	nA	$V_{EB} = -5.6\text{V}$
Static Forward Current Transfer Ratio (Note 13)	h_{FE}	300	450	900	-	$I_C = -10\text{mA}, V_{CE} = -2\text{V}$
		200	300	-		$I_C = -1\text{A}, V_{CE} = -2\text{V}$
		30	60	-		$I_C = -3\text{A}, V_{CE} = -2\text{V}$
Collector-Emitter Saturation Voltage (Note 13)	$V_{CE(sat)}$	-	-170	-260	mV	$I_C = -1\text{A}, I_B = -20\text{mA}$
		-	-65	-85		$I_C = -1\text{A}, I_B = -100\text{mA}$
		-	-165	-220		$I_C = -3\text{A}, I_B = -300\text{mA}$
Base-Emitter Saturation Voltage (Note 13)	$V_{BE(sat)}$	-	-930	-1000	mV	$I_C = -3\text{A}, I_B = -300\text{mA}$
Base-Emitter Saturation Voltage (Note 13)	$V_{BE(on)}$	-	-830	-900	mV	$I_C = -3\text{A}, V_{CE} = -2\text{V}$
Output Capacitance	C_{obo}	-	17.4		pF	$V_{CB} = -10\text{V}, f = 1\text{MHz}$
Transition Frequency	f_T	-	270	-	MHz	$V_{CE} = -10\text{V}, I_C = -50\text{mA}, f = 100\text{MHz}$
Turn-on Time	$t_{(on)}$	-	75.5	-	ns	$V_{CC} = -15\text{V}, I_C = -750\text{mA},$
Turn-off Time	$t_{(off)}$	-	320	-	ns	$I_{B1} = -I_{B2} = -15\text{mA}$

 Note: 13. 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.)

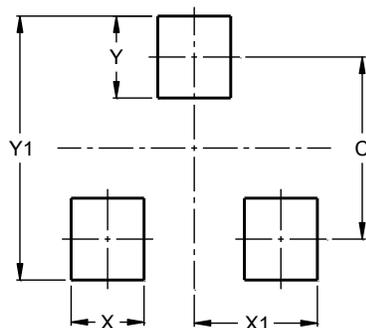


Package Outline Dimensions

SOT23


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

SOT23


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