



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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Package Outline Dimensions Features

- Epitaxial Planar Die Construction
- Complementary NPN Types Available (DDTC)
- Built-In Biasing Resistors, R1≠R2

Mechanical Data

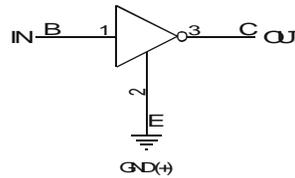
- Case: SOT523
- Case Material: Molded Plastic, "Green" Molding Compound
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 (E3)
- Weight: 0.002 grams (Approximate)

Part Number	R1 (NOM)	R2 (NOM)
NK-DDTA113ZE	1kΩ	10kΩ
NK-DDTA123YE	2.2kΩ	10kΩ
NK-DDTA123JE	2.2kΩ	47kΩ
NK-DDTA143XE	4.7kΩ	10kΩ
NK-DDTA143FE	4.7kΩ	22kΩ
NK-DDTA143ZE	4.7kΩ	47kΩ
NK-DDTA114YE	10kΩ	47kΩ
NK-DDTA114WE	10kΩ	4.7kΩ
NK-DDTA124XE	22kΩ	47kΩ
NK-DDTA144VE	47kΩ	10kΩ
NKDDTA144WE	47kΩ	22kΩ

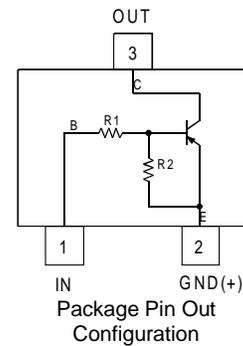
SOT523



Top View



Device Schematic



Package Pin Out Configuration

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

Characteristic	Symbol	Value	Unit					
Supply Voltage, (2) to (3)	V _{CC}	-50	V					
Input Voltage, (1) to (2)	V _{IN}	NK-DDTA113ZE NK-DDTA123YE NK-DDTA123JE NK-DDTA143XE NK-DDTA143FE NK-DDTA143ZE NK-DDTA114YE NK-DDTA114WE NK-DDTA124XE NK-DDTA144VE NK-DDTA144WE	+5 to -10 +5 to -12 +5 to -12 +7 to -20 +6 to -30 +5 to -30 +6 to -40 +10 to -30 +10 to -40 +15 to -40 +10 to -40	V				
		Output Current	I _O	NK-DDTA113ZE NK-DDTA123YE NK-DDTA123JE NK-DDTA143XE NK-DDTA143FE NK-DDTA143ZE NK-DDTA114YE NK-DDTA114WE NK-DDTA124XE NK-DDTA144VE NK-DDTA144WE	-100 -100 -100 -100 -100 -100 -70 -100 -50 -30 -30	mA		
				Output Current	All	I _{C(MAX)}	-100	mA

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P _D	150	mW
Thermal Resistance, Junction to Ambient Air (Note 5)	R _{θJA}	833	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

Note: 5. Mounted on FR4 PC Board with minimum recommended pad layout.

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

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition	
Input Voltage	NK-DDTA113ZE NK-DDTA123YE NK-DDTA123JE NK-DDTA143XE NK-DDTA143FE NK-DDTA143ZE NK-DDTA114YE NK-DDTA114WE NK-DDTA124XE NK-DDTA144VE NK-DDTA144WE	V _{I(OFF)}	-0.3 -0.3 -0.5 -0.3 -0.3 -0.5 -0.3 -0.8 -0.4 -1.0 -0.8	—	—	—	V	V _{CC} = -5V, I _O = -100μA
	NK-DDTA113ZE NK-DDTA123YE NK-DDTA123JE NK-DDTA143XE NK-DDTA143FE NK-DDTA143ZE NK-DDTA114YE NK-DDTA114WE NK-DDTA124XE NK-DDTA144VE NK-DDTA144WE	V _{I(ON)}	—	—	-3.0 -3.0 -1.1 -2.5 -1.3 -1.3 -1.4 -3.0 -2.5 -5.0 -4.0	—	—	V _O = -0.3V, I _O = -20mA V _O = -0.3V, I _O = -20mA V _O = -0.3V, I _O = -5mA V _O = -0.3V, I _O = -20mA V _O = -0.3V, I _O = -3mA V _O = -0.3V, I _O = -5mA V _O = -0.3V, I _O = -1mA V _O = -0.3V, I _O = -2mA V _O = -0.3V, I _O = -2mA V _O = -0.3V, I _O = -2mA V _O = -0.3V, I _O = -2mA
Output Voltage		V _{O(ON)}	—	-0.1	-0.3	V	I _O /I _I = -5mA/-0.25mA NK-DDTA123E I _O /I _I = -5mA/-0.25mA NK-DDTA143E I _O /I _I = -5mA/-0.25mA NK-DDTA114E I _O /I _I = -10mA/-0.5mA All Others	
Input Current	NK-DDTA113ZE NK-DDTA123YE NK-DDTA123JE NK-DDTA143XE NK-DDTA143FE NK-DDTA143ZE NK-DDTA114YE NK-DDTA114WE NK-DDTA124XE NK-DDTA144VE NK-DDTA144WE	I _I	—	—	-7.2 -3.8 -3.6 -1.8 -1.8 -1.8 -0.88 -0.88 -0.36 -0.16 -0.16	mA	V _I = -5V	
Output Current		I _{O(OFF)}	—	—	-0.5	μA	V _{CC} = -50V, V _I = 0V	
DC Current Gain	NK-DDTA113ZE NK-DDTA123YE NK-DDTA123JE NK-DDTA143XE NK-DDTA143FE NK-DDTA143ZE NK-DDTA114YE NK-DDTA114WE NK-DDTA124XE NK-DDTA144VE NK-DDTA144WE	G _I	33 33 80 30 68 80 68 24 68 33 56	—	—	—	V _O = -5V, I _O = -10mA	
Input Resistor Tolerance		ΔR ₁	-30	—	+30	%	—	
Resistance Ratio Tolerance		ΔR ₂ /R ₁	-20	—	+20	%	—	
Gain-Bandwidth Product (Note 6)		f _T	—	250	—	MHz	V _{CE} = -10V, I _E = 5mA, f = 100MHz	

Note: 6. Transistor – For Reference Only

Typical Curves – NK-DDTA123JE

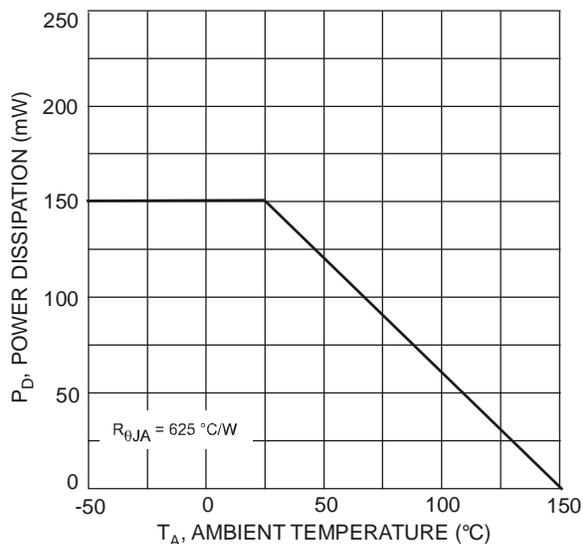


Fig. 1 Power Dissipation vs. Ambient Temperature

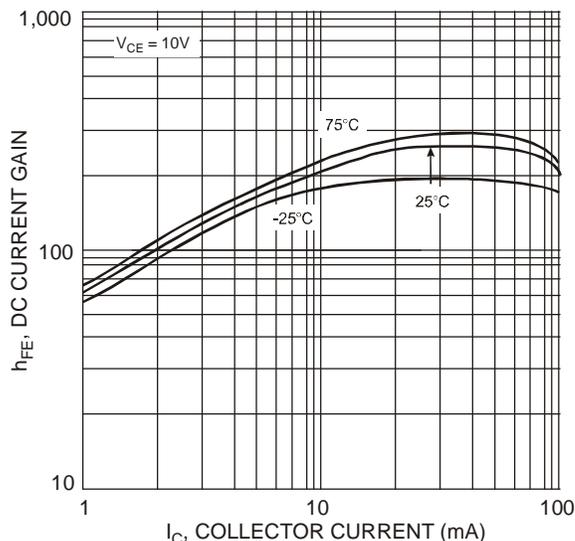


Fig. 2 Typical DC Current Gain vs. Collector Current

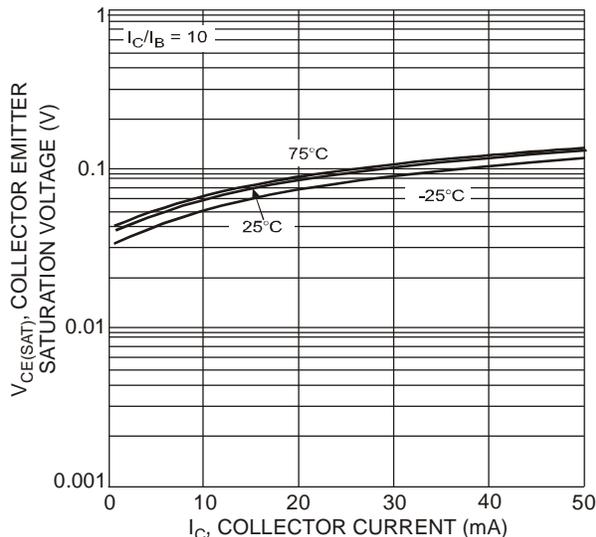


Fig. 3 Collector Emitter Saturation Voltage vs. Collector Current

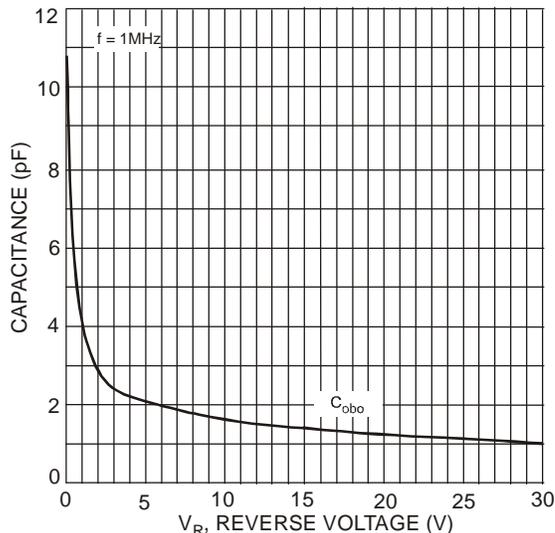


Fig. 4 Typical Capacitance Characteristics

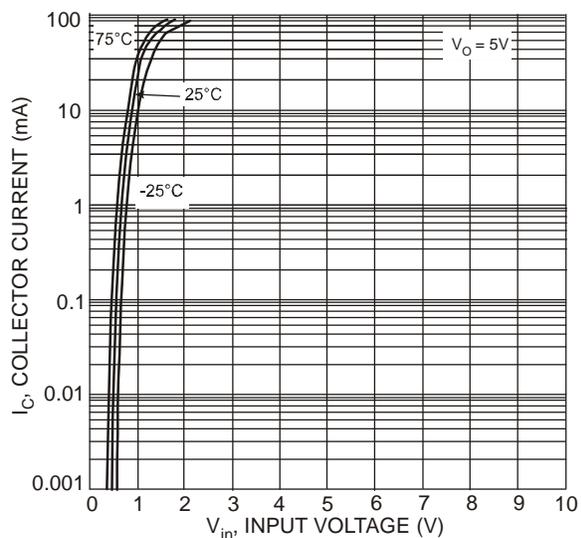


Fig. 5 Collector Current vs. Input Voltage

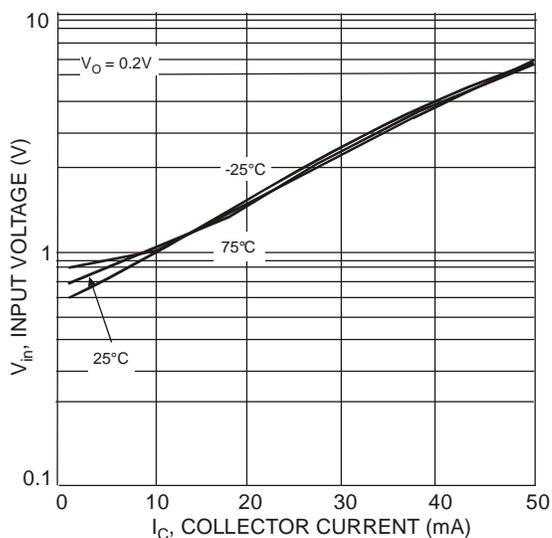
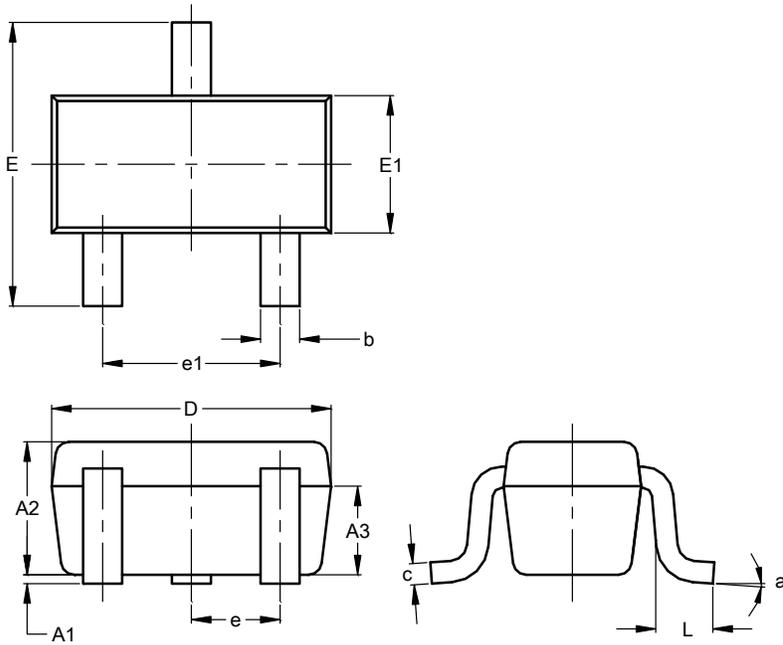


Fig. 6 Input Voltage vs. Collector Current

Package Outline Dimensions

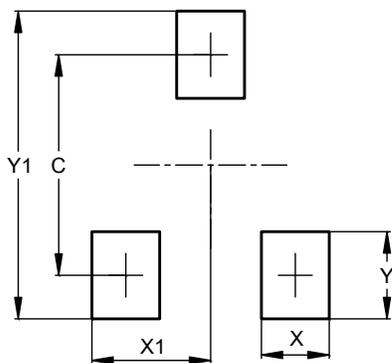
SOT523



SOT523			
Dim	Min	Max	Typ
A1	0.00	0.10	0.05
A2	0.60	0.80	0.75
A3	0.45	0.65	0.50
b	0.15	0.30	0.22
c	0.10	0.20	0.12
D	1.50	1.70	1.60
E	1.45	1.75	1.60
E1	0.75	0.85	0.80
e	0.50 BSC		
e1	0.90	1.10	1.00
L	0.20	0.40	0.33
a	0°	--	8°
All Dimensions in mm			

Suggested Pad Layout

SOT523



Dimensions	Value
C	1.29
X	0.40
X1	0.70
Y	0.51
Y1	1.80