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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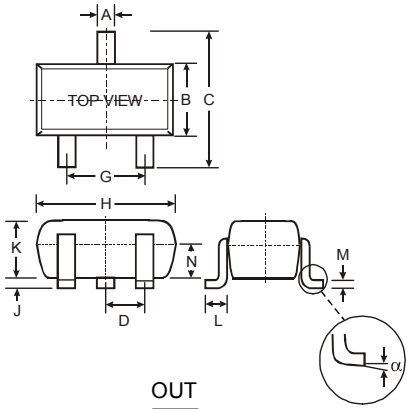
Features

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

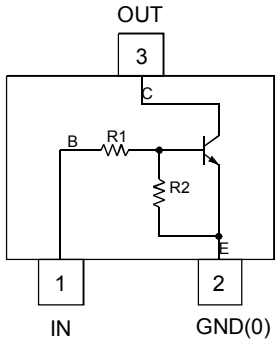
Mechanical Data

- Case: SOT-523
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminals: Solderable per MIL-STD-202, Method 208
- Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe)
- Terminal Connections: See Diagram
- Marking & Date Code Information: See Table Below & Page 4
- Ordering Information: See Page 4
- Weight: 0.002 grams (approximate)

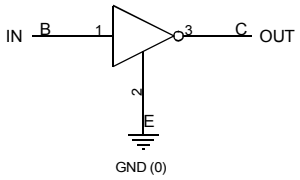


SOT-523			
Dim	**Min**	**Max**	**Typ**
A	0.15	0.30	0.22
B	0.75	0.85	0.80
C	1.45	1.75	1.60
D	—	—	0.50
G	0.90	1.10	1.00
H	1.50	1.70	1.60
J	0.00	0.10	0.05
K	0.60	0.80	0.75
L	0.10	0.30	0.22
M	0.10	0.20	0.12
N	0.45	0.65	0.50
α	0°	8°	—
All Dimensions in mm			

P/N	R1 (NOM)	R2 (NOM)	Marking
NK-DDTC113ZE	1KΩ	10KΩ	N02
NK-DDTC123YE	2.2KΩ	10KΩ	N05
NK-DDTC123JE	2.2KΩ	47KΩ	N06
NK-DDTC143XE	4.7KΩ	10KΩ	N09
NK-DDTC143FE	4.7KΩ	22KΩ	N10
NK-DDTC143ZE	4.7KΩ	47KΩ	N11
NK-DDTC114YE	10KΩ	47KΩ|	N14
NK-DDTC114WE	10KΩ	4.7KΩ	N15
NK-DDTC124XE	22KΩ	47KΩ	N18
NK-DDTC144VE	47KΩ	10KΩ	N21
NK-DDTC144WE	47KΩ	22KΩ	N22



Schematic and Pin Configuration



Equivalent Inverter Circuit

Maximum Ratings @T_A = 25°C unless otherwise specified

Characteristic		Symbol	Value	Unit
Supply Voltage (3) to (2)		V_{CC}	50	V
Input Voltage, (1) to (2)	NK-DDTC113ZE	V_{IN}	-5 to +10	V
	NK-DDTC123YE		-5 to +12	
	NK-DDTC123JE		-5 to +12	
	NK-DDTC143XE		-7 to +20	
	NK-DDTC143FE		-6 to +30	
	NK-DDTC143ZE		-5 to +30	
	NK-DDTC114YE		-6 to +40	
	NK-DDTC114WE		-10 to +30	
	NK-DDTC124XE		-10 to +40	
	NK-DDTC144VE		-15 to +40	
	NK-DDTC144WE		-10 to +40	
Output Current	NK-DDTC113ZE	I_O	100	mA
	NK-DDTC123YE		100	
	NK-DDTC123JE		100	
	NK-DDTC143XE		100	
	NK-DDTC143FE		100	
	NK-DDTC143ZE		100	
	NK-DDTC114YE		70	
	NK-DDTC114WE		100	
	NK-DDTC124XE		50	
	NK-DDTC144VE		30	
	NK-DDTC144WE		30	
Output Current	All	I_C (Max)	100	mA

Thermal Characteristics @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Power Dissipation	P_d	150	mW
Thermal Resistance, Junction to Ambient Air (Note 1)	$R_{\theta JA}$	833	°C/W
Operating and Storage Temperature Range	T_j, T_{STG}	-55 to +150	°C

Electrical Characteristics @T_A = 25°C unless otherwise specified

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage	NK-DDTC113ZE	$V_{I(off)}$	0.3	—	—	V	V_{CC} = 5V, I_O = 100μA
	NK-DDTC123YE		0.3				
	NK-DDTC123JE		0.5				
	NK-DDTC143XE		0.3				
	NK-DDTC143FE		0.3				
	NK-DDTC143ZE		0.5				
	NK-DDTC114YE		0.3				
	NK-DDTC114WE		0.8				
	NK-DDTC124XE		0.4				
	NK-DDTC144VE		1.0				
	NK-DDTC144WE		0.8				
	NK-DDTC113ZE	$V_{I(on)}$	—	—	3.0		V_O = 0.3V, I_O = 20mA
	NK-DDTC123YE				3.0		V_O = 0.3V, I_O = 20mA
	NK-DDTC123JE				1.1		V_O = 0.3V, I_O = 5mA
	NK-DDTC143XE				2.5		V_O = 0.3V, I_O = 20mA
	NK-DDTC143FE				1.3		V_O = 0.3V, I_O = 3mA
	NK-DDTC143ZE				1.3		V_O = 0.3V, I_O = 5mA
	NK-DDTC114YE				1.4		V_O = 0.3V, I_O = 1mA
	NK-DDTC114WE				3.0		V_O = 0.3V, I_O = 2mA
	NK-DDTC124XE				2.5		V_O = 0.3V, I_O = 2mA
	NK-DDTC144VE				5.0		V_O = 0.3V, I_O = 2mA
	NK-DDTC144WE				4.0		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-DDTC123JE I_O/I_I = 5mA/0.25mA NK-DDTC143ZE I_O/I_I = 5mA/0.25mA NK-DDTC114YE I_O/I_I = 10mA/0.5mA All Others
Input Current	NK-DDTC113ZE	I_I	—	—	7.2	mA	V_I = 5V
	NK-DDTC123YE				3.8		
	NK-DDTC123JE				3.6		
	NK-DDTC143XE				1.8		
	NK-DDTC143FE				1.8		
	NK-DDTC143ZE				1.8		
	NK-DDTC114YE				0.88		
	NK-DDTC114WE				0.88		
	NK-DDTC124XE				0.36		
	NK-DDTC144VE				0.16		
	NK-DDTC144WE				0.16		
Output Current		$I_{O(off)}$	—	—	0.5	μA	V_{CC} = 50V, V_I = 0V
DC Current Gain	NK-DDTC113ZE	G_I	33	—	—	—	V_O = 5V, I_O = 5mA
	NK-DDTC123YE		33				V_O = 5V, I_O = 10mA
	NK-DDTC123JE		80				V_O = 5V, I_O = 10mA
	NK-DDTC143XE		30				V_O = 5V, I_O = 10mA
	NK-DDTC143FE		68				V_O = 5V, I_O = 10mA
	NK-DDTC143ZE		80				V_O = 5V, I_O = 10mA
	NK-DDTC114YE		68				V_O = 5V, I_O = 5mA
	NK-DDTC114WE		24				V_O = 5V, I_O = 10mA
	NK-DDTC124XE		68				V_O = 5V, I_O = 5mA
	NK-DDTC144VE		33				V_O = 5V, I_O = 5mA
	NK-DDTC144WE		56				V_O = 5V, I_O = 5mA
Input Resistor Tolerance		ΔR_1	-30	—	+30	%	—
Resistance Ratio Tolerance		$\Delta R_2/R_1$	-20	—	+20	%	—
Gain-Bandwidth Product*		f_T	—	250	—	MHz	V_{CE} = 10V, I_E = 5mA, f = 100MHz

* Transistor – For Reference Only

TYPICAL CURVES – NK-DDTC123JE

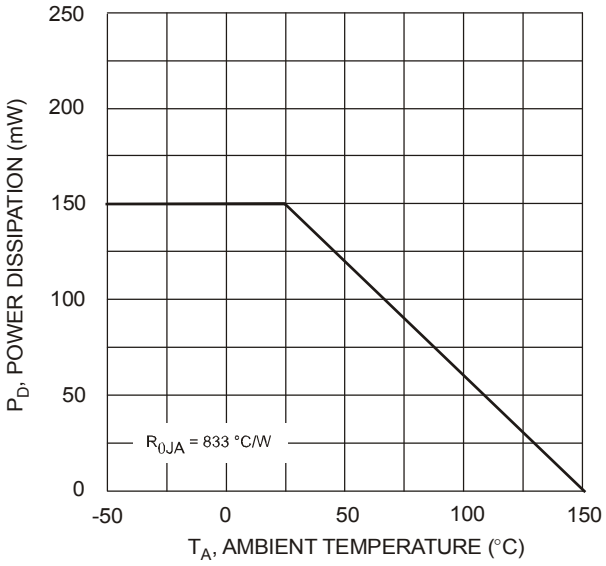


Fig. 1 Derating Curve

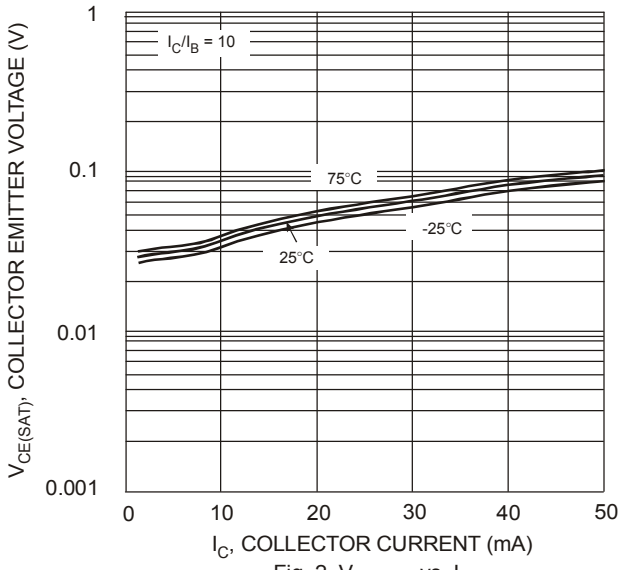


Fig. 2 $V_{CE(SAT)}$ vs. I_C

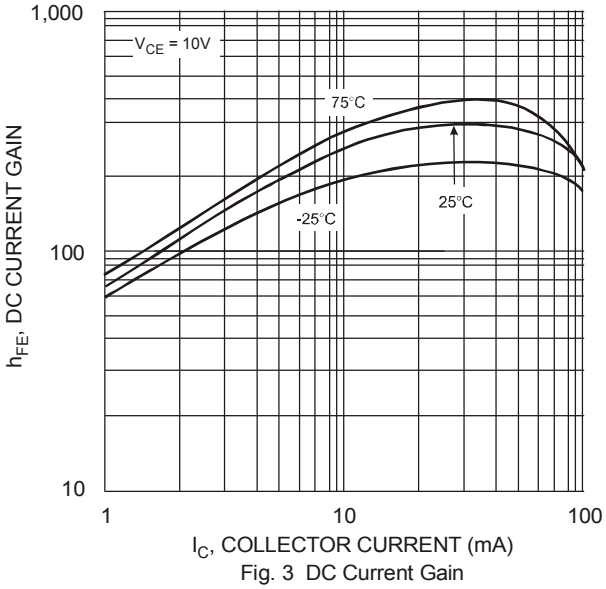


Fig. 3 DC Current Gain

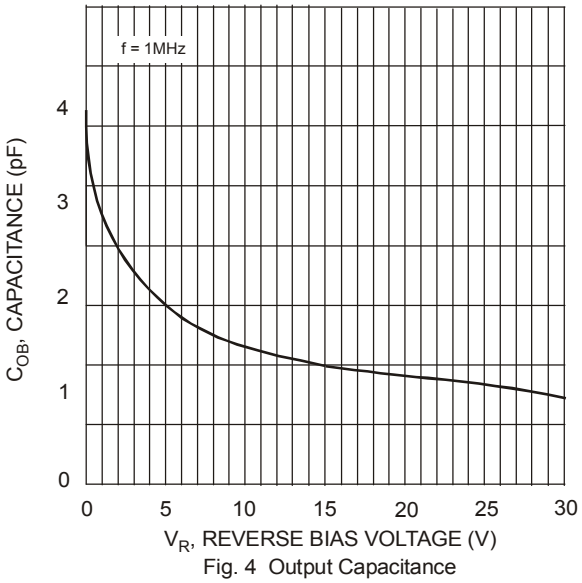


Fig. 4 Output Capacitance

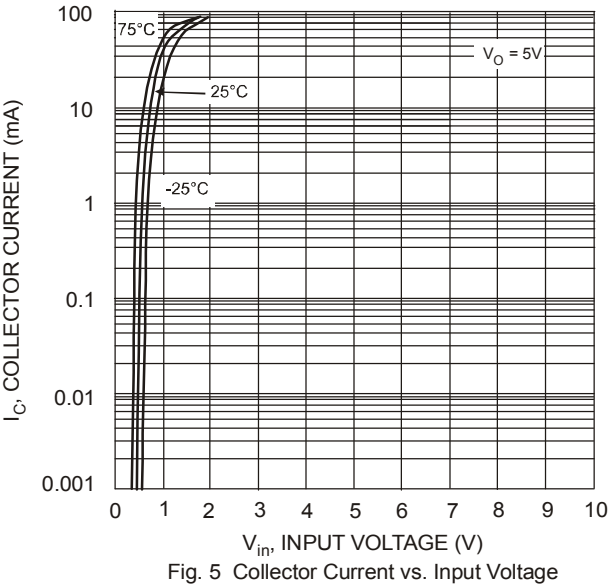


Fig. 5 Collector Current vs. Input Voltage

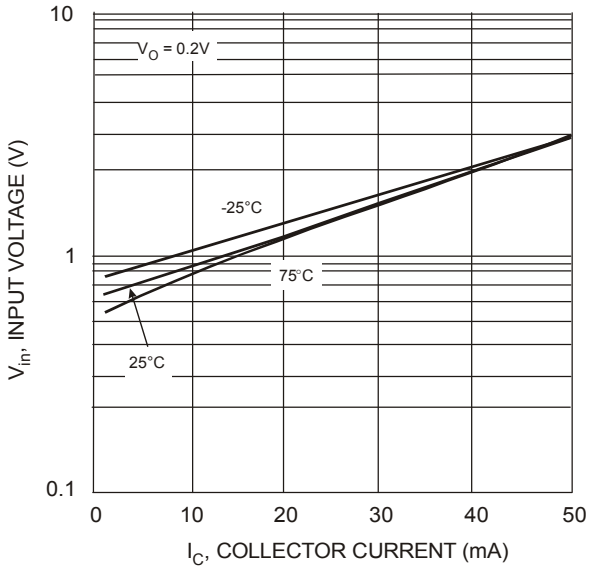


Fig. 6 Input Voltage vs. Collector Current