



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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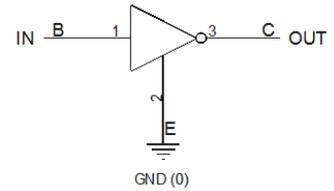
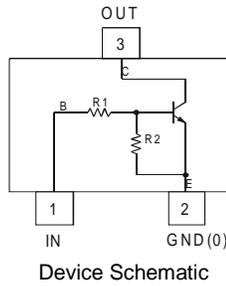
Features

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

Mechanical Data

- Case: 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)

Part Number	R1, R2 (NOM)
NK-DDTC123ECA	2.2kΩ
NK-DDTC143ECA	4.7kΩ
NK-DDTC114ECA	10kΩ
NK-DDTC124ECA	22kΩ
NK-DDTC144ECA	47kΩ
NK-DDTC115ECA	100kΩ



Equivalent Inverter Circuit

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

Characteristic		Symbol	Value	Unit
Supply Voltage <Pin: (3) to (2)>		V _{CC}	50	V
Input Voltage <Pin: (1) to (2)>	NK-DDTC123ECA	V _{IN}	-10 to +12	V
	NK-DDTC143ECA		-10 to +30	
	NK-DDTC114ECA		-10 to +40	
	NK-DDTC124ECA		-10 to +40	
	NK-DDTC144ECA		-10 to +40	
Output Current	NK-DDTC123ECA	I _O	100	mA
	NK-DDTC143ECA		100	
	NK-DDTC114ECA		50	
	NK-DDTC124ECA		30	
	NK-DDTC144ECA		30	
Output Current		I _C (Max)	100	mA

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 7)	P _D	200	mW
Thermal Resistance, Junction to Ambient Air (Note 7)	R _{θJA}	625	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

Note: 7. 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		V _{I(off)}	0.5	1.1	—	V	V _{CC} = 5V, I _O = 100μA
		V _{I(on)}	—	1.9	3		V _O = 0.3V, I _O = 20mA, NK-DDTC123ECA V _O = 0.3V, I _O = 20mA, NK-DDTC143ECA V _O = 0.3V, I _O = 10mA, NK-DDTC114ECA V _O = 0.3V, I _O = 5mA, NK-DDTC124ECA V _O = 0.3V, I _O = 2mA, NK-DDTC144ECA V _O = 0.3V, I _O = 1mA, NK-DDTC115ECA
Output Voltage		V _{O(on)}	—	0.1	0.3	V	I _O /I _I = 10mA/0.5mA, NK-DDTC123ECA I _O /I _I = 10mA/0.5mA, NK-DDTC143ECA I _O /I _I = 10mA/0.5mA, NK-DDTC114ECA I _O /I _I = 10mA/0.5mA, NK-DDTC124ECA I _O /I _I = 10mA/0.5mA, NK-DDTC144ECA I _O /I _I = 5mA/0.25mA, NK-DDTC115ECA
Input Current	NK-DDTC123ECA NK-DDTC143ECA NK-DDTC114ECA NK-DDTC124ECA NK-DDTC144ECA NK-DDTC115ECA	I _I	—	—	3.8 1.8 0.88 0.36 0.18 0.15	mA	V _I = 5V
Output Current		I _{O(off)}	—	—	0.5	μA	V _{CC} = 50V, V _I = 0V
DC Current Gain	NK-DDTC123ECA NK-DDTC143ECA NK-DDTC114ECA NK-DDTC114ECAQ NK-DDTC124ECA NK-DDTC144ECA NK-DDTC144ECAQ NK-DDTC115ECA	G _I	20 20 30 35 56 68 80 82	—	—	—	V _O = 5V, I _O = 20mA V _O = 5V, I _O = 10mA V _O = 5V, I _O = 5mA V _O = 5V, I _O = 5mA
Input Resistor Tolerance		ΔR ₁	-30	—	+30	%	—
Resistance Ratio Tolerance		ΔR ₂ /R ₁	0.8	1	1.2	%	—
Gain-Bandwidth Product (Note 8)		f _T	—	250	—	MHz	V _{CE} = 10V, I _E = 5mA, f = 100MHz

Typical Characteristics – NK-DDTC143ECA (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

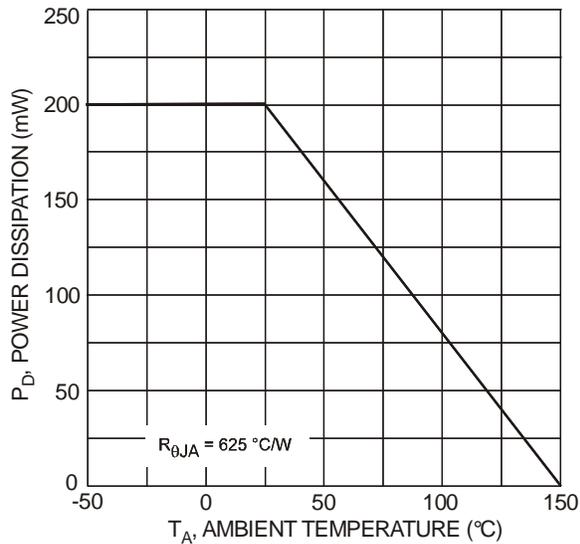


Fig. 1 Power Dissipation vs. Ambient Temperature

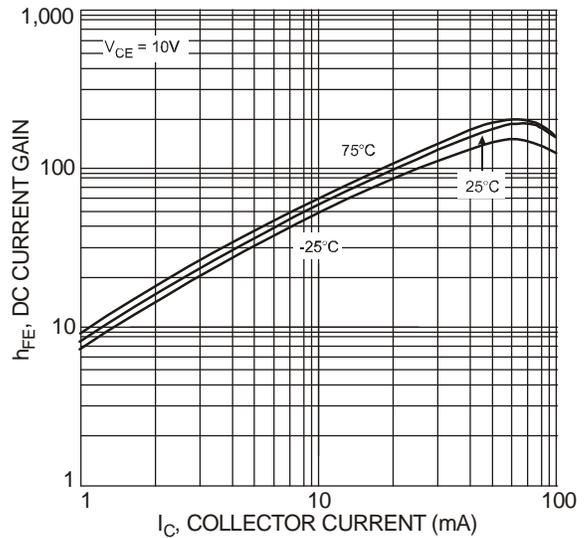


Fig. 2 Typical DC Current Gain vs. Collector Current

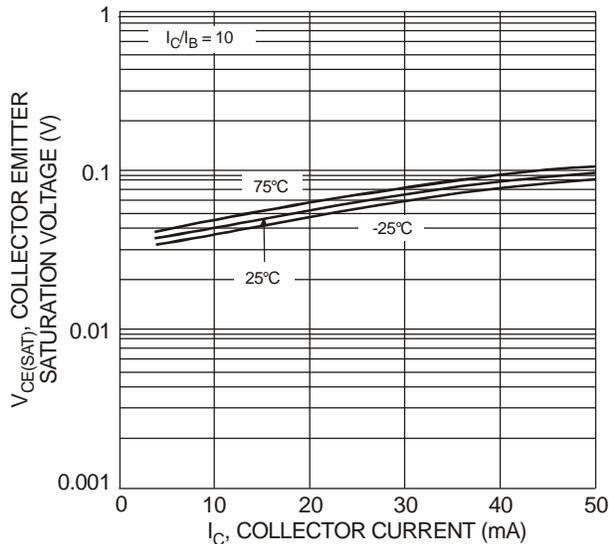


Fig. 3 Typical Collector Emitter Saturation Voltage vs. Collector Current

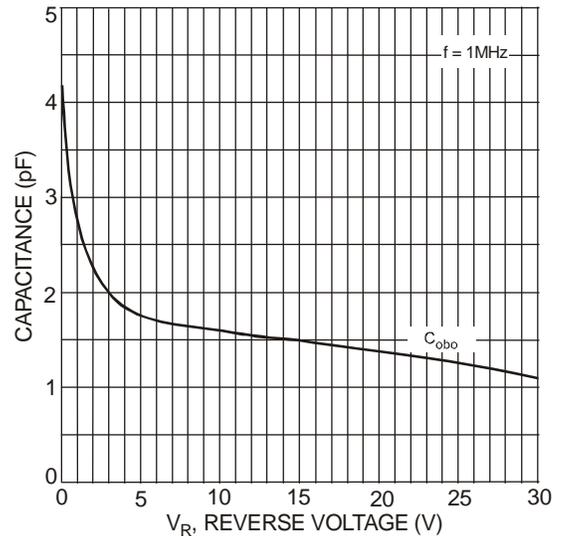


Fig. 4 Typical Capacitance Characteristics

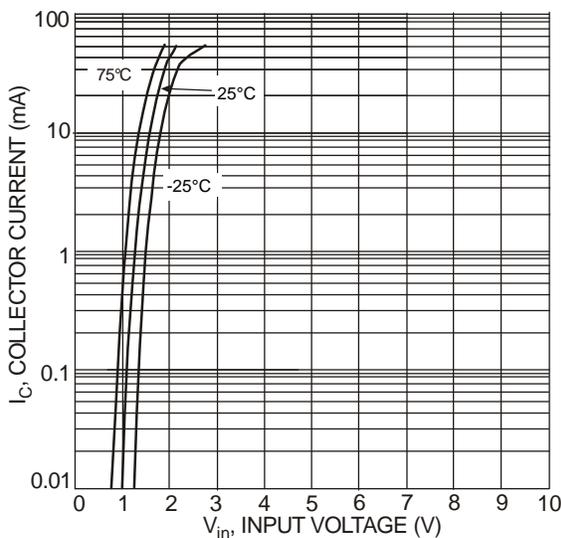


Fig. 5 Collector Current vs. Input Voltage

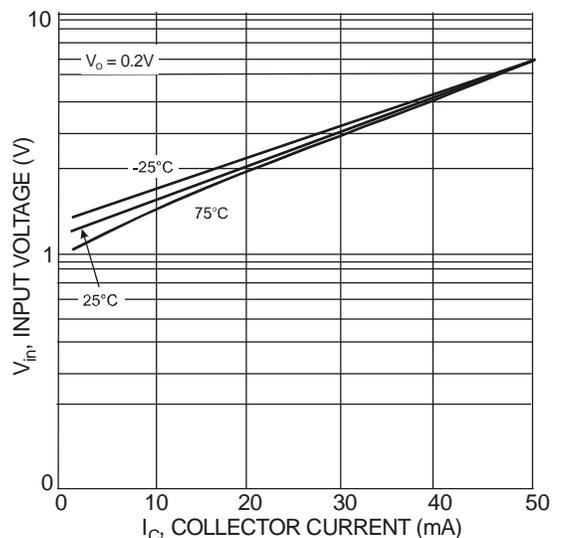
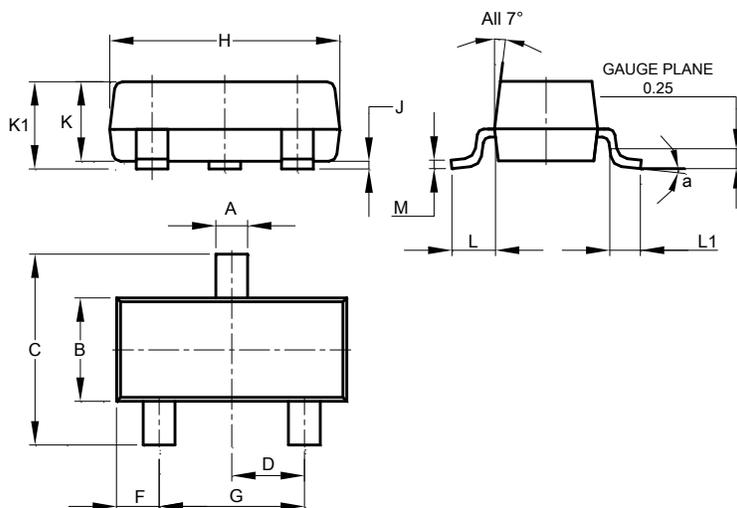


Fig. 6 Input Voltage vs. Collector Current

Package Outline Dimensions

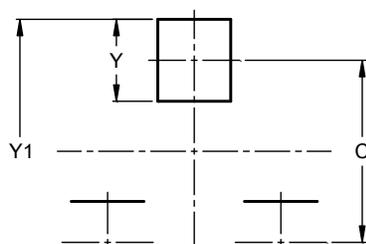
SOT23



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