



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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企业微信二维码



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## Features

- Epitaxial Planar Die Construction
- Complementary PNP Types Available (DDTB)
- Built-In Biasing Resistors

## 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)

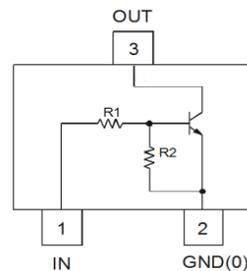
P/N	R1 (NOM)	R2 (NOM)
NK-DDTD113EC	1k $\Omega$	1k $\Omega$
NK-DDTD123EC	2.2k $\Omega$	2.2k $\Omega$
NK-DDTD143EC	4.7k $\Omega$	4.7k $\Omega$
NK-DDTD114EC	10k $\Omega$	10k $\Omega$
NK-DDTD122JC	0.22k $\Omega$	4.7k $\Omega$
NK-DDTD113ZC	1k $\Omega$	10k $\Omega$

P/N	R1 (NOM)	R2 (NOM)
NK-DDTD123YC	2.2k $\Omega$	10k $\Omega$
NK-DDTD133HC	3.3k $\Omega$	10k $\Omega$
NK-DDTD123TC	2.2k $\Omega$	OPEN
NK-DDTD143TC	4.7k $\Omega$	OPEN
NK-DDTD114TC	10k $\Omega$	OPEN
NK-DDTD114GC	0	10k $\Omega$

SOT23



Top View



Device Schematic

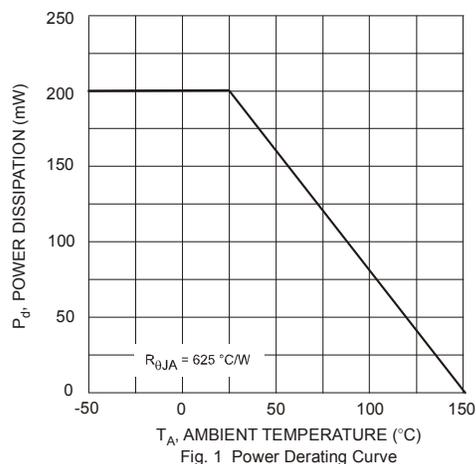
**Absolute Maximum Ratings** (@  $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Supply Voltage <Pin: (3) to (2)>		$V_{CC}$	50	V
Input Voltage <Pin: (1) to (2)>	NK-DDTD113EC NK-DDTD123EC NK-DDTD143EC NK-DDTD114EC NK-DDTD122JC NK-DDTD113ZC NK-DDTD123YC NK-DDTD133HC	$V_{IN}$	-10 to +10 -10 to +12 -10 to +30 -10 to +40 -5 to +5 -5 to +10 -5 to +12 -6 to +20	V
Input Voltage <Pin: (2) to (1)>	NK-DDTD123TC NK-DDTD143TC NK-DDTD114TC NK-DDTD114GC	$V_{EBO (MAX)}$	5	V
Output Current		$I_C$	500	mA

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

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	$P_D$	200	mW
Thermal Resistance, Junction to Ambient Air (Note 5)	$R_{\theta JA}$	625	$^\circ\text{C/W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

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



**Electrical Characteristics - R1, R2 Types** (@  $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage	NK-DDTD113EC NK-DDTD123EC NK-DDTD143EC NK-DDTD114EC NK-DDTD122JC NK-DDTD113ZC NK-DDTD123YC NK-DDTD133HC	0.5 0.5 0.5 0.5 0.5 0.3 0.3 0.3	—	—	V	$V_{CC} = 5V, I_O = 100\mu\text{A}$
	NK-DDTD113EC NK-DDTD123EC NK-DDTD143EC NK-DDTD114EC NK-DDTD122JC NK-DDTD113ZC NK-DDTD123YC NK-DDTD133HC	—	—	3.0 3.0 3.0 3.0 3.0 2.0 2.0 2.0	V	$V_O = 0.3V, I_O = 20\text{mA}$ $V_O = 0.3V, I_O = 20\text{mA}$ $V_O = 0.3V, I_O = 20\text{mA}$ $V_O = 0.3V, I_O = 10\text{mA}$ $V_O = 0.3V, I_O = 30\text{mA}$ $V_O = 0.3V, I_O = 20\text{mA}$ $V_O = 0.3V, I_O = 20\text{mA}$ $V_O = 0.3V, I_O = 20\text{mA}$
Output Voltage		—	—	0.3V	V	$I_O/I_I = 50\text{mA}/2.5\text{mA}$
Input Current	NK-DDTD113EC NK-DDTD123EC NK-DDTD143EC NK-DDTD114EC NK-DDTD122JC NK-DDTD113ZC NK-DDTD123YC NK-DDTD133HC	—	—	7.2 3.8 1.8 0.88 28 7.2 3.6 2.4	mA	$V_I = 5V$
Output Current		—	—	0.5	$\mu\text{A}$	$V_{CC} = 50V, V_I = 0V$
DC Current Gain	NK-DDTD113EC NK-DDTD123EC NK-DDTD143EC NK-DDTD114EC NK-DDTD122JC NK-DDTD113ZC NK-DDTD123YC NK-DDTD133HC	33 39 47 56 47 56 56 56	—	—	—	$V_O = 5V, I_O = 50\text{mA}$
Gain-Bandwidth Product (Note 6)		—	200	—	MHz	$V_{CE} = 10V, I_E = 5\text{mA}, f = 100\text{MHz}$

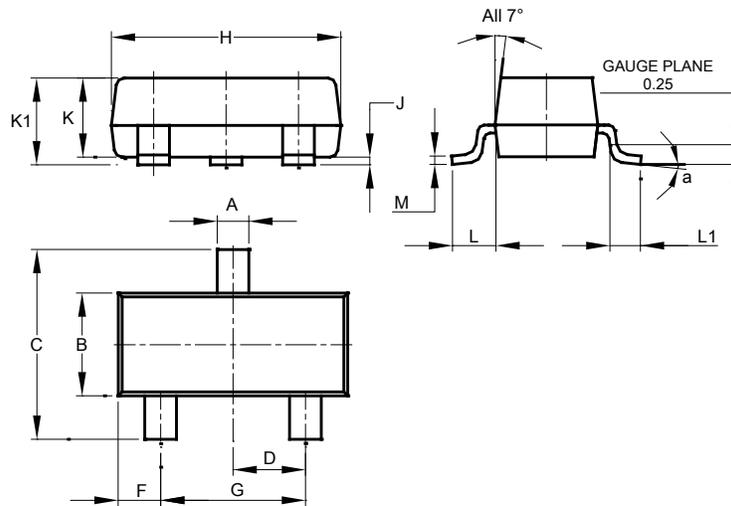
**Electrical Characteristics - R1- Only, R2- Only Types** (@  $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	$BV_{CBO}$	50	—	—	V	$I_C = 50\mu\text{A}$
Collector-Emitter Breakdown Voltage	$BV_{CEO}$	40	—	—	V	$I_C = 1\text{mA}$
Emitter-Base Breakdown Voltage	NK-DDTD123TC NK-DDTD143TC NK-DDTD114TC NK-DDTD114GC	5	—	—	V	$I_E = 50\mu\text{A}$ $I_E = 50\mu\text{A}$ $I_E = 50\mu\text{A}$ $I_E = 720\mu\text{A}$
Collector Cut-Off Current	$I_{CBO}$	—	—	0.5	$\mu\text{A}$	$V_{CB} = 50V$
Emitter Cut-Off Current	NK-DDTD123TC NK-DDTD143TC NK-DDTD114TC NK-DDTD114GC	— — — 300	—	0.5 0.5 0.5 580	$\mu\text{A}$	$V_{EB} = 4V$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	—	—	0.3	V	$I_C = 50\text{mA}, I_B = 2.5\text{mA}$
DC Current Transfer Ratio	NK-DDTD123TC NK-DDTD143TC NK-DDTD114TC NK-DDTD114GC	100 100 100 56	250 250 250 —	600 600 600 —	—	$I_C = 5\text{mA}, V_{CE} = 5V$
Gain-Bandwidth Product (Note 6)		—	200	—	MHz	$V_{CE} = 10V, I_E = 5\text{mA}, f = 100\text{MHz}$

Note: 6. Transistor – For Reference Only

## Package Outline Dimensions

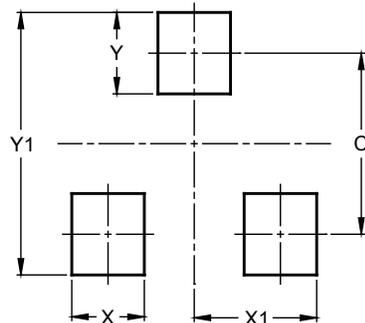
SOT23



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