



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
- Built-In Biasing Resistors
- Surface Mount Package Suited for Automated Assembly

Mechanical Data

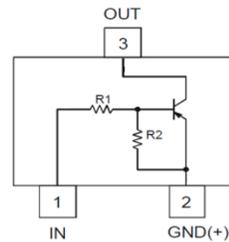
- Package: SOT23
- Package Material: Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 ③
- Weight: 0.008 grams (Approximate)

Part Number	R1(NOM)	R2(NOM)
NK-DDTB113EC	1kΩ	1kΩ
NK-DDTB123EC	2.2kΩ	2.2kΩ
NK-DDTB143EC	4.7kΩ	4.7kΩ
NK-DDTB114EC	10kΩ	10kΩ
NK-DDTB122JC	0.22kΩ	4.7kΩ
NK-DDTB113ZC	1kΩ	10kΩ
NK-DDTB123YC	2.2kΩ	10kΩ
NK-DDTB133HC	3.3kΩ	10kΩ
NK-DDTB123TC	2.2kΩ	Open
NK-DDTB143TC	4.7kΩ	Open
NK-DDTB114TC	10kΩ	Open
NK-DDTB114GC	0	10kΩ

SOT23



Top View



Device Schematic

Absolute 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-DDTB113EC NK-DDTB123EC NK-DDTB143EC NK-DDTB114EC NK-DDTB122JC NK-DDTB113ZC NK-DDTB123YC NK-DDTB133HC	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, (1) to (2) NK-DDTB123TC NK-DDTB143TC NK-DDTB114TC NK-DDTB114GC	V _{EBO(MAX)}	-5	V
Output Current All	I _C	-500	mA

Thermal Characteristics (@T_A = +25°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 _{θJA}	625	°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 (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

R1, R2 Types

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage	NK-DDTB113EC NK-DDTB123EC NK-DDTB143EC NK-DDTB114EC NK-DDTB122JC NK-DDTB113ZC NK-DDTB123YC NK-DDTB133HC	$V_{I(off)}$	-0.5 -0.5 -0.5 -0.5 -0.5 -0.3 -0.3 -0.3	—	—	V	$V_{CC} = -5V, I_o = -100\mu A$
	NK-DDTB113EC NK-DDTB123EC NK-DDTB143EC NK-DDTB114EC NK-DDTB122JC NK-DDTB113ZC NK-DDTB123YC NK-DDTB133HC	$V_{I(on)}$	—	—	-3.0 -3.0 -3.0 -3.0 -3.0 -2.0 -2.0 -2.0	V	$V_o = -0.3V, I_o = -20mA$ $V_o = -0.3V, I_o = -20mA$ $V_o = -0.3V, I_o = -20mA$ $V_o = -0.3V, I_o = -10mA$ $V_o = -0.3V, I_o = -30mA$ $V_o = -0.3V, I_o = -20mA$ $V_o = -0.3V, I_o = -20mA$ $V_o = -0.3V, I_o = -20mA$
Output Voltage		$V_{O(on)}$	—	—	-0.3	V	$I_o/I_i = -50mA/-2.5mA$
Input Current	NK-DDTB113EC NK-DDTB123EC NK-DDTB143EC NK-DDTB114EC NK-DDTB122JC NK-DDTB113ZC NK-DDTB123YC NK-DDTB133HC	I_i	—	—	-7.2 -3.8 -1.8 -0.88 -28 -7.2 -3.6 -2.4	mA	$V_i = -5V$
Output Current		$I_{o(off)}$	—	—	-0.5	μA	$V_{CC} = -50V, V_i = 0V$
DC Current Gain	NK-DDTB113EC NK-DDTB123EC NK-DDTB143EC NK-DDTB114EC NK-DDTB122JC NK-DDTB113ZC NK-DDTB123YC NK-DDTB133HC	G_i	33 39 47 56 47 56 56 56	—	—	—	$V_o = -5V, I_o = -50mA$
Gain-Bandwidth Product (Note 6)		f_T	—	200	—	MHz	$V_{CE} = -10V, I_E = -5mA, f = 100MHz$

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

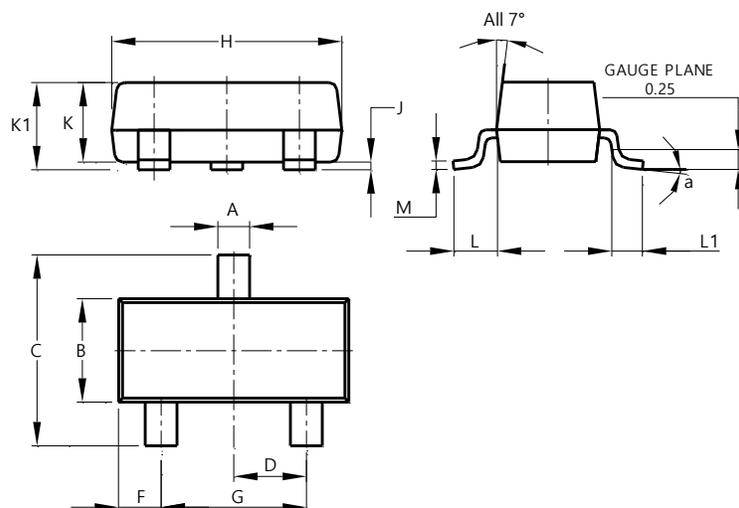
R1-Only, R2-Only Types

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage		BV_{CBO}	-50	—	—	V	$I_C = -50\mu A$
Collector-Emitter Breakdown Voltage		BV_{CEO}	-40	—	—	V	$I_C = -1mA$
Emitter-Base Breakdown Voltage	NK-DDTB123TC NK-DDTB143TC NK-DDTB114TC NK-DDTB114GC	BV_{EBO}	-5	—	—	V	$I_E = -50\mu A$ $I_E = -50\mu A$ $I_E = -50\mu A$ $I_E = -720\mu A$
Collector Cutoff Current		I_{CBO}	—	—	-0.5	μA	$V_{CB} = -50V$
Emitter Cutoff Current	NK-DDTB123TC NK-DDTB143TC NK-DDTB114TC NK-DDTB114GC	I_{EBO}	— — — -300	—	-0.5 -0.5 -0.5 -580	μA	$V_{EB} = -4V$
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$	—	—	-0.3	V	$I_C = -50mA, I_B = -2.5mA$
DC Current Transfer Ratio	NK-DDTB123TC NK-DDTB143TC NK-DDTB114TC NK-DDTB114GC	h_{FE}	100 100 100 56	250 250 250 —	600 600 600 —	—	$I_C = -5mA, V_{CE} = -5V$
Gain-Bandwidth Product (Note 6)		f_T	—	200	—	MHz	$V_{CE} = -10V, I_E = -5mA, f = 100MHz$

Note: 6. Transistor - For Reference Only.

Package Outline Dimensions

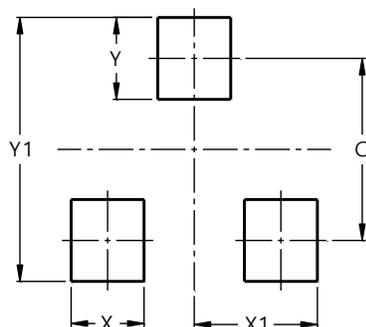
SOT23



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