



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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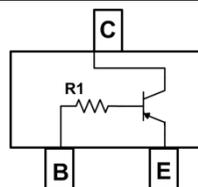
## Features

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

## Mechanical Data

- Case: SOT323
- 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 Ⓔ③
- Weight: 0.006 grams (Approximate)

Part Number	R1 (NOM)
NK-DDTA113TUA	1k $\Omega$
NK-DDTA123TUA	2.2k $\Omega$
NK-DDTA143TUA	4.7k $\Omega$
NK-DDTA114TUA	10k $\Omega$
NK-DDTA124TUA	22k $\Omega$
NK-DDTA144TUA	47k $\Omega$
NK-DDTA115TUA	100k $\Omega$
NK-DDTA125TUA	200k $\Omega$



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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$V_{CB0}$	-50	V
Collector-Emitter Voltage	$V_{CEO}$	-50	V
Emitter-Base Voltage	$V_{EBO}$	-5	V
Collector Current	$I_C$ (Max)	-100	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	$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	$BV_{CB0}$	-50	—	—	V	$I_C = -50\mu\text{A}$
Collector-Emitter Breakdown Voltage	$BV_{CEO}$	-50	—	—	V	$I_C = -1\text{mA}$
Emitter-Base Breakdown Voltage	$BV_{EBO}$	-5	—	—	V	$I_E = -50\mu\text{A}$
Collector Cutoff Current	$I_{CBO}$	—	—	-0.5	$\mu\text{A}$	$V_{CB} = -50\text{V}$
Emitter Cutoff Current	$I_{EBO}$	—	—	-0.5	$\mu\text{A}$	$V_{EB} = -4\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	—	—	-0.3	V	$I_C/I_B = -10\text{mA}/-1\text{mA}$ NK-DDTA113TUA
						$I_C/I_B = -5\text{mA}/-0.5\text{mA}$ NK-DDTA123TUA
						$I_C/I_B = -2.5\text{mA}/-0.25\text{mA}$ NK-DDTA143TUA
						$I_C/I_B = -1\text{mA}/-0.1\text{mA}$ NK-DDTA114TUA
						$I_C/I_B = -5\text{mA}/-0.5\text{mA}$ NK-DDTA124TUA
						$I_C/I_B = -2.5\text{mA}/-0.25\text{mA}$ NK-DDTA144TUA
						$I_C/I_B = -1\text{mA}/-0.1\text{mA}$ NK-DDTA115TUA
$I_C/I_B = -0.5\text{mA}/-0.05\text{mA}$ NK-DDTA125TUA						
DC Current Transfer Ratio	$h_{FE}$	100	250	600	—	$I_C = -1\text{mA}, V_{CE} = -5\text{V}$
Input Resistor ( $R_1$ ) Tolerance	$\Delta R_1$	-30	—	+30	%	—
Gain-Bandwidth Product (Note 6)	$f_T$	—	250	—	MHz	$V_{CE} = -10\text{V}, I_E = -5\text{mA}, f = 100\text{MHz}$

Notes: 5. Mounted on FR4 PC Board with minimum recommended pad layout.  
 6. Transistor - For Reference Only

**Typical Characteristics – NK-DDTA114TUA** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

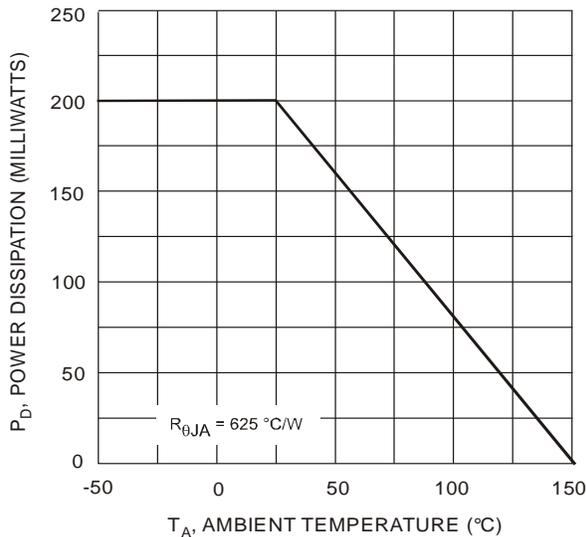


Fig. 1 Derating Curve

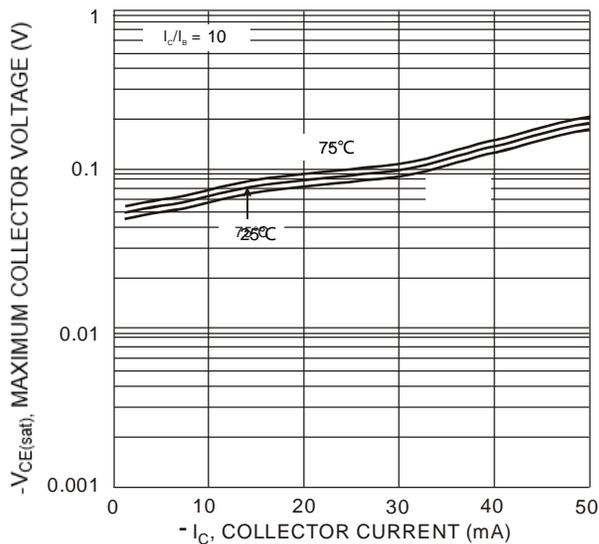


Fig. 2  $V_{CE(sat)}$  vs.  $I_C$

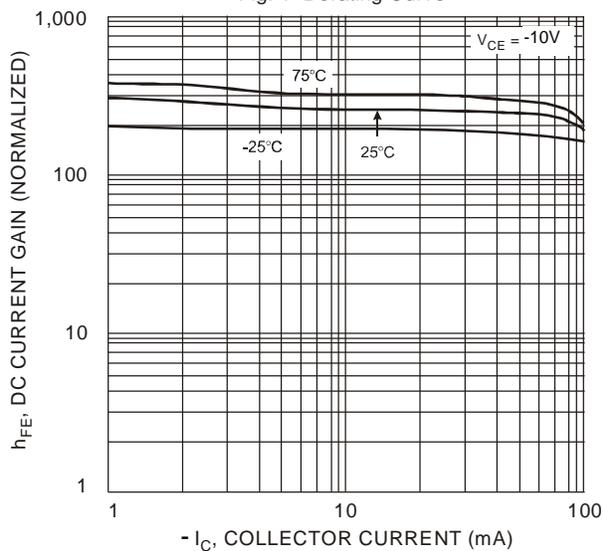


Fig. 3 DC Current Gain

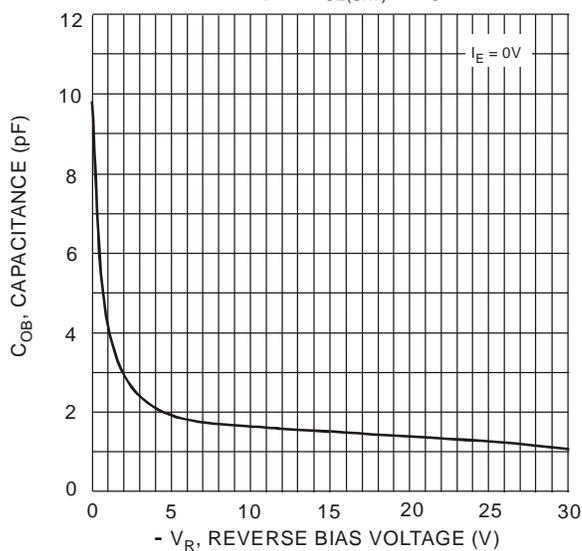


Fig. 4 Output Capacitance

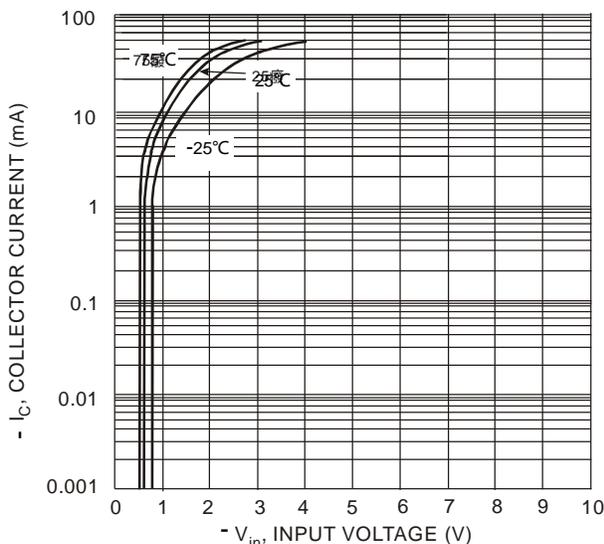


Fig. 5 Collector Current vs. Input Voltage

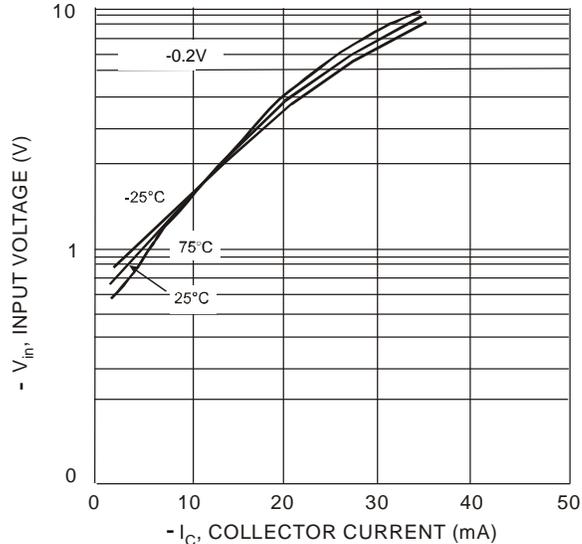
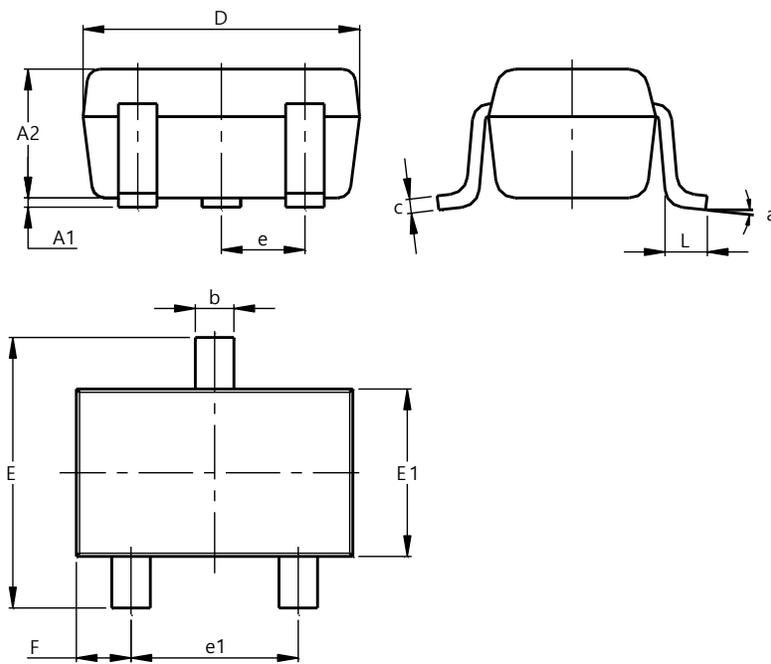


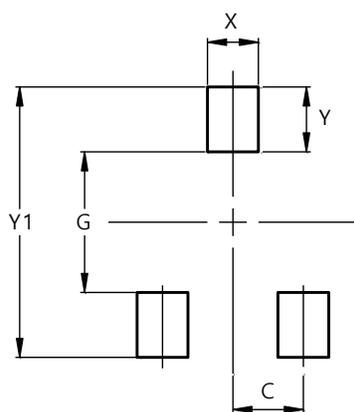
Fig. 6 Input Voltage vs. Collector Current

## Package Outline Dimensions

**SOT323**


SOT323			
Dim	Min	Max	Typ
A1	0.00	0.10	0.05
A2	0.90	1.00	0.95
b	0.25	0.40	0.30
c	0.10	0.18	0.11
D	1.80	2.20	2.15
E	2.00	2.20	2.10
E1	1.15	1.35	1.30
e	0.650 BSC		
e1	1.20	1.40	1.30
F	0.375	0.475	0.425
L	0.25	0.40	0.30
a	0°	8°	--
All Dimensions in mm			

## Suggested Pad Layout

**SOT323**


Dimensions	Value (in mm)
C	0.650
G	1.300
X	0.470
Y	0.600
Y1	2.500