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

0755-83047638
ysbdt@szyoushang.cn
www.szyoushang.cn

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Features

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

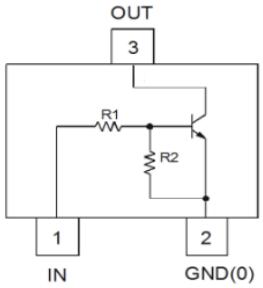
Mechanical Data

- Case: SOT523
- 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 e3
- Weight: 0.002 grams (Approximate)

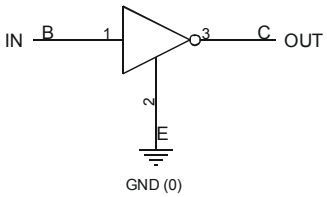
Part Number	R1, R2 (NOM)
NK-DDTC123EE	2.2kΩ
NK-DDTC143EE	4.7kΩ
NK-DDTC114EE	10kΩ
NK-DDTC124EE	22kΩ
NK-DDTC144EE	47kΩ
NK-DDTC115EE	100kΩ

SOT523

Top View



Device Schematic



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-DDTC123EE NK-DDTC143EE NK-DDTC114EE NK-DDTC124EE NK-DDTC144EE NK-DDTC115EE	V_I	-10 to +12 -10 to +30 -10 to +40 -10 to +40 -10 to +40 -10 to +40	V
Output Current	NK-DDTC123EE NK-DDTC143EE NK-DDTC114EE NK-DDTC124EE NK-DDTC144EE NK-DDTC115EE	I_O	100 100 50 30 100 20	mA
Output Current		I_C (Max)	100	mA

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

Characteristic	Symbol	Value	Unit
Power Dissipation (Notes 5 & 6)	P_D	150	mW
Thermal Resistance, Junction to Ambient Air (Note 5)	$R_{\theta JA}$	833	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

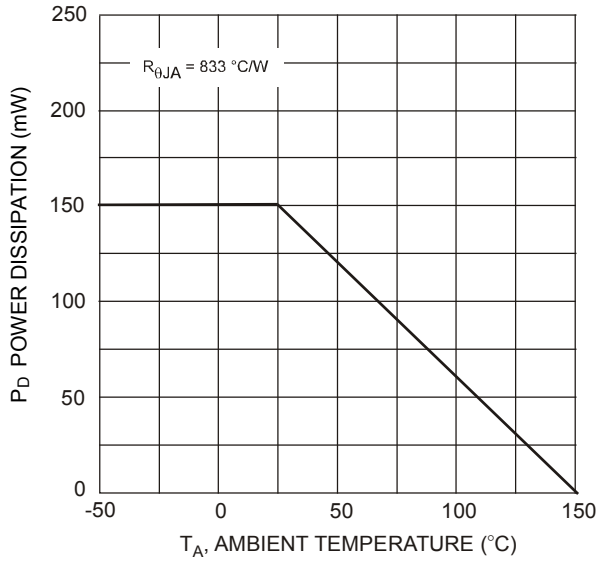
Notes: 5. Mounted on FR-4 PC Board with minimum recommended pad layout.
6. 150mW per element must not be exceeded.

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

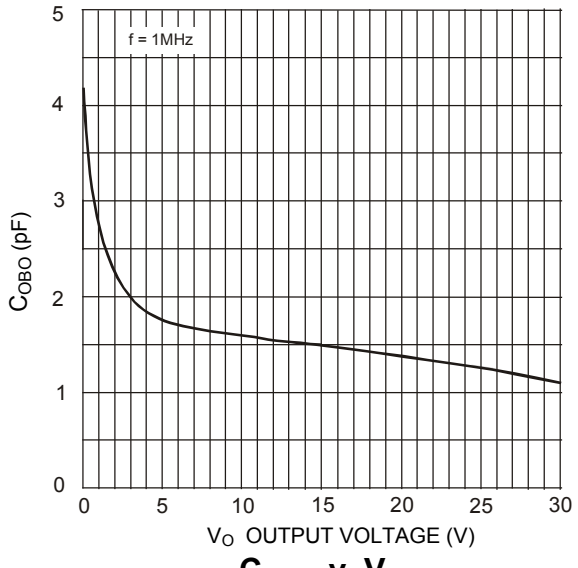
Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage		$V_{I(off)}$ (Note 7)	0.5	1.1	—	V	V_{CC} = 5V, I_O = 100μA
		$V_{I(on)}$ (Note 8)	—	1.9	3		V_O = 0.3V, I_O = 20mA, NK-DDTC123EE V_O = 0.3V, I_O = 20mA, NK-DDTC143EE V_O = 0.3V, I_O = 10mA, NK-DDTC114EE V_O = 0.3V, I_O = 5mA, NK-DDTC124EE V_O = 0.3V, I_O = 2mA, NK-DDTC144EE V_O = 0.3V, I_O = 1mA, NK-DDTC115EE
Output Voltage		$V_{O(on)}$	—	0.1	0.3	V	I_O/I_I = 10mA/0.5mA, NK-DDTC123EE I_O/I_I = 10mA/0.5mA, NK-DDTC143EE I_O/I_I = 10mA/0.5mA, NK-DDTC114EE I_O/I_I = 10mA/0.5mA, NK-DDTC124EE I_O/I_I = 10mA/0.5mA, NK-DDTC144EE I_O/I_I = 5mA/0.25mA, NK-DDTC115EE
Input Current	NK-DDTC123EE NK-DDTC143EE NK-DDTC114EE NK-DDTC124EE NK-DDTC144EE NK-DDTC115EE	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-DDTC123EE NK-DDTC143EE NK-DDTC114EE NK-DDTC124EE NK-DDTC144EE NK-DDTC115EE	G_I	20 20 30 56 68 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 V_O = 5V, I_O = 5mA V_O = 5V, I_O = 5mA
Input Resistor Tolerance		ΔR_1	-30	—	+30	%	—
Resistance Ratio Tolerance		$\Delta R_2/R_1$	0.8	1	1.2	%	—
Transition frequency (Note 9)		f_T	—	250	—	MHz	V_{CE} = -10V, I_E = 5mA, f = 100MHz

Notes: 7. Guarantees that the device will be switched OFF if the Input Voltage is less than 0.5V.
8. Guarantees that the device will be switched ON if the Input Voltage is more than 3V.
9. Transistor only.

Typical Electrical Characteristics

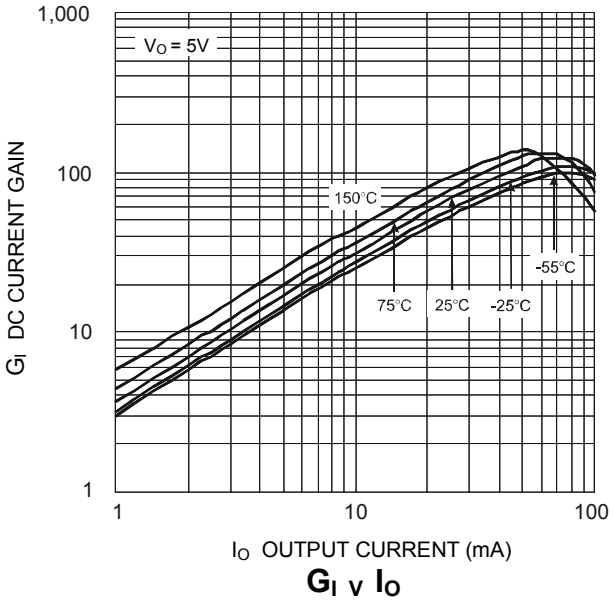


Derating Curve

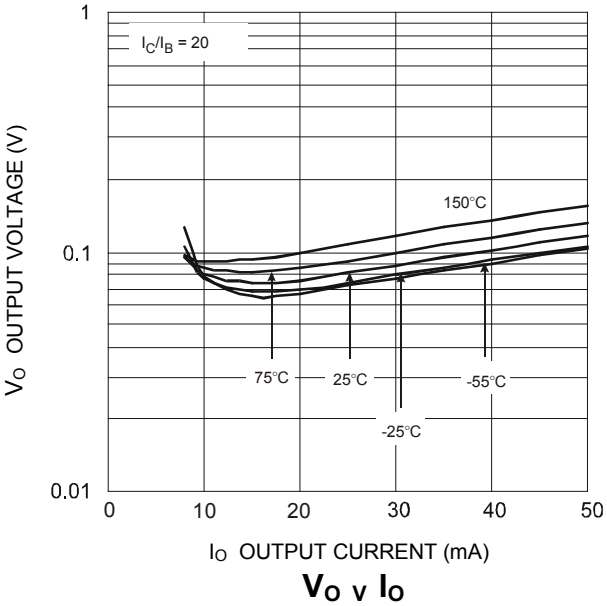


C_{OBO} v V_O

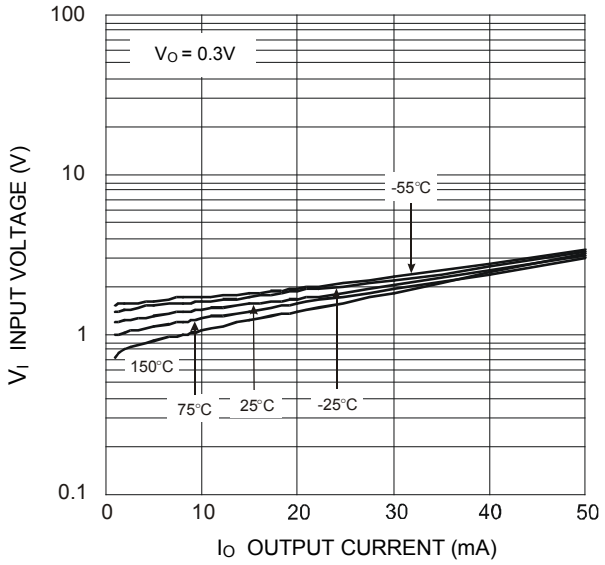
Typical Electrical Characteristics – NK-DDTC123EE



G_I v I_O

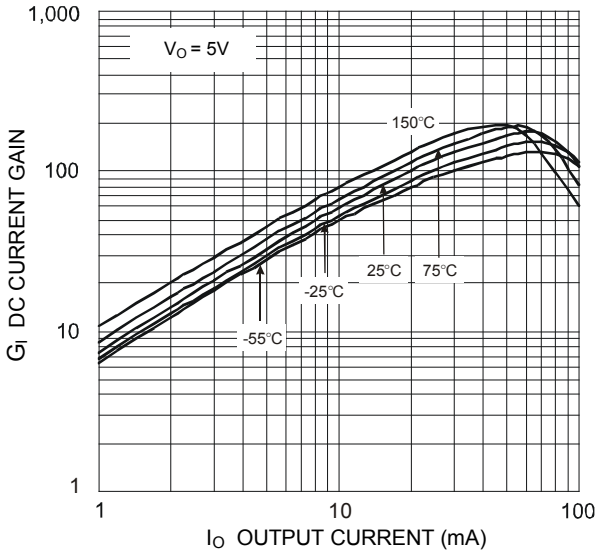


V_O v I_O

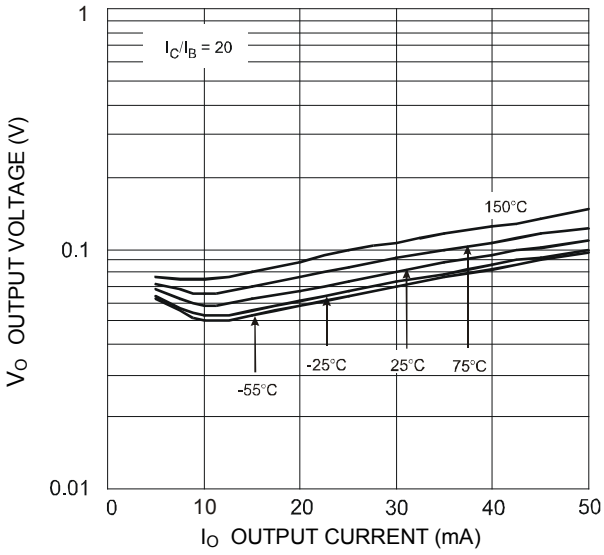


V_I v I_O

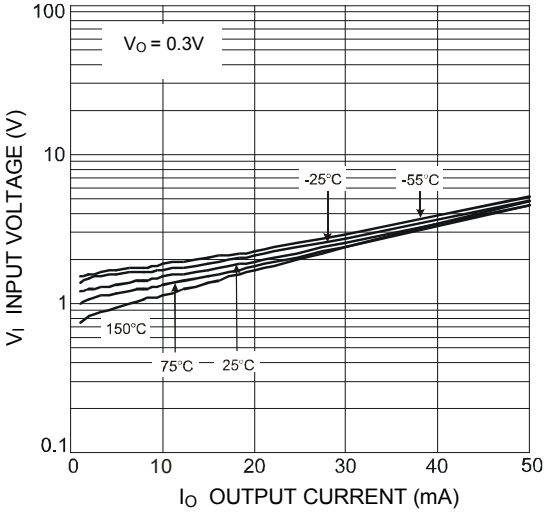
Typical Electrical Characteristics – NK-DDTC143EE



G_I v I_O

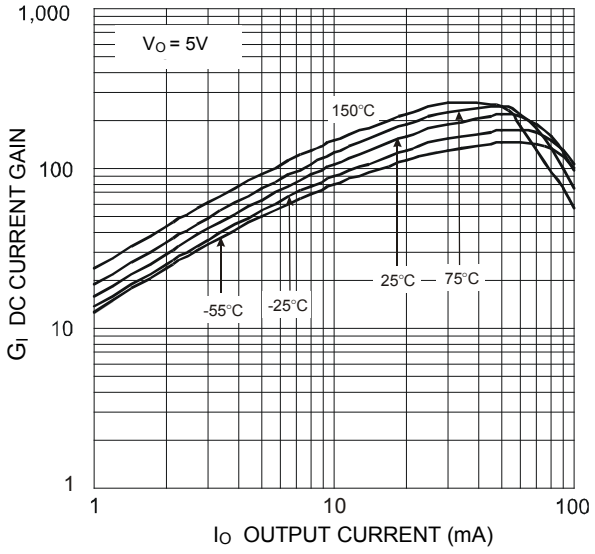


V_O v I_O

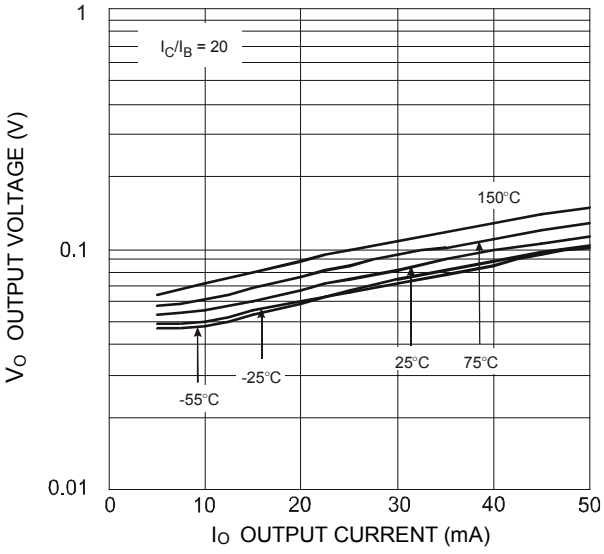


V_I v I_O

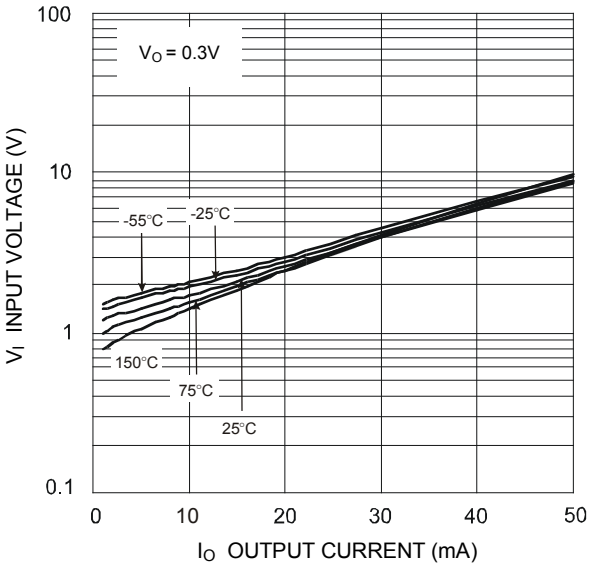
Typical Electrical Characteristics – NK-DDTC114EE



G_I v I_O

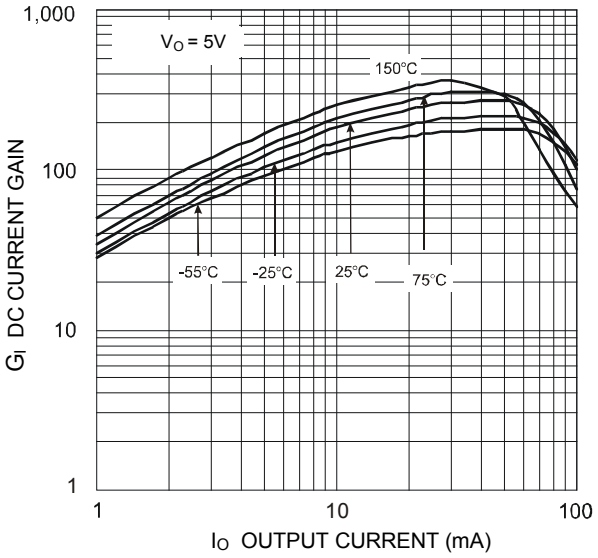


V_O v I_O

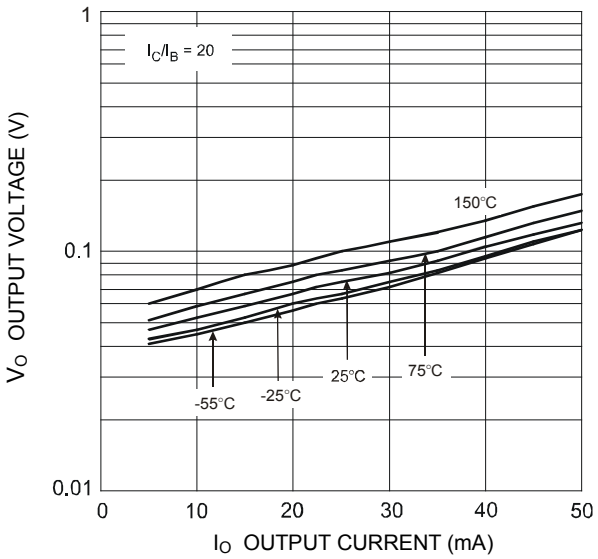


V_I v I_O

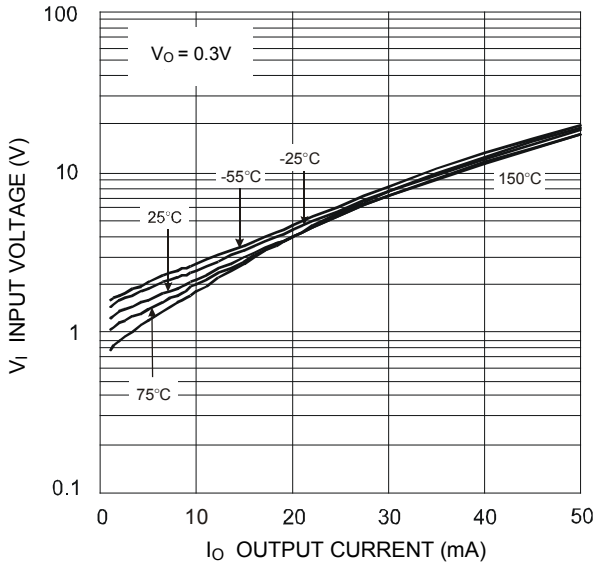
Typical Electrical Characteristics – NK-DDTC124EE



G_I v I_O

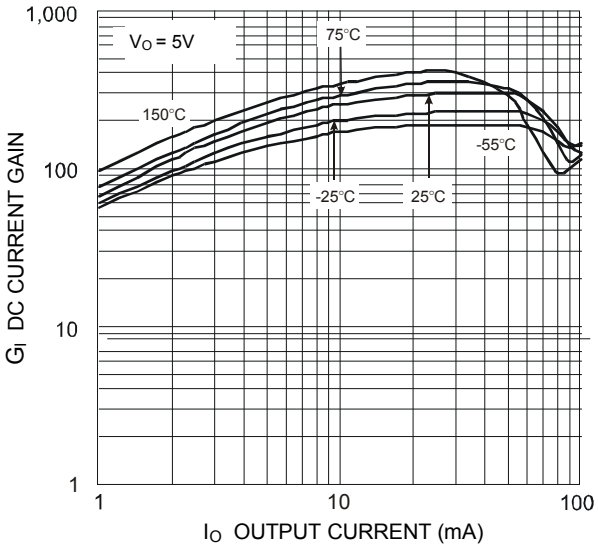


V_O v I_O

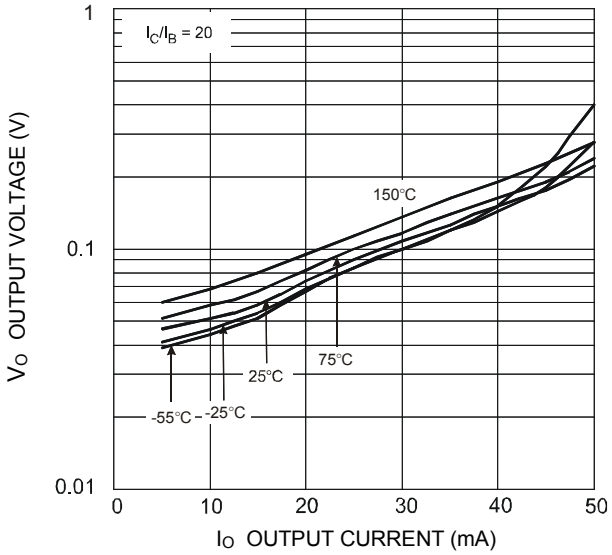


V_I v I_O

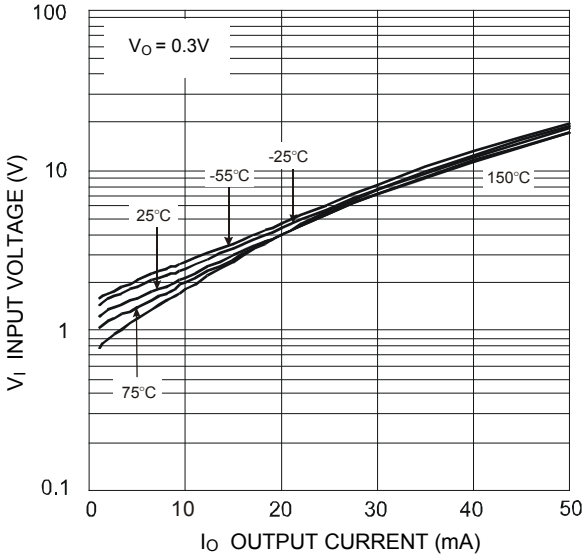
Typical Electrical Characteristics – NK-DDTC144EE



G_I v I_O



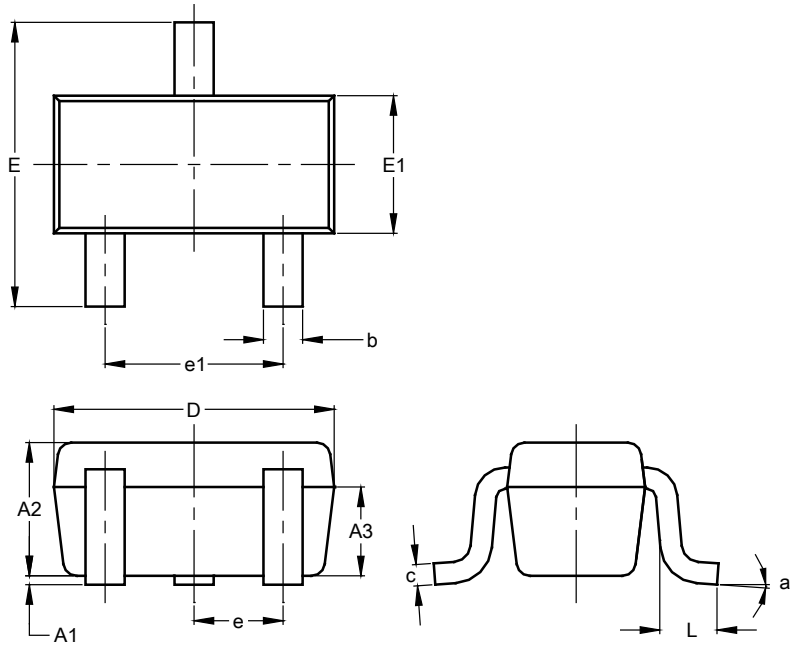
V_O v I_O



V_I v I_O

Package Outline Dimensions

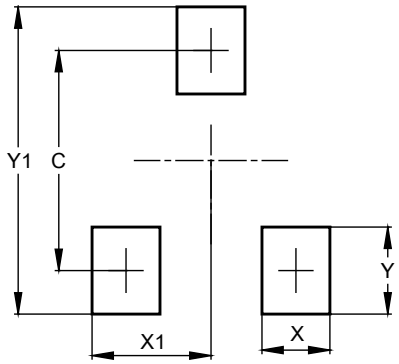
SOT523



SOT523			
Dim	**Min**	**Max**	**Typ**
A1	0.00	0.10	0.05
A2	0.60	0.80	0.75
A3	0.45	0.65	0.50
b	0.15	0.30	0.22
c	0.10	0.20	0.12
D	1.50	1.70	1.60
E	1.45	1.75	1.60
E1	0.75	0.85	0.80
e	0.50 BSC		
e1	0.90	1.10	1.00
L	0.20	0.40	0.33
a	0°	--	8°
All Dimensions in mm			

Suggested Pad Layout

SOT523



Dimensions	Value (in mm)
C	1.29
X	0.40
X1	0.70
Y	0.51
Y1	1.80