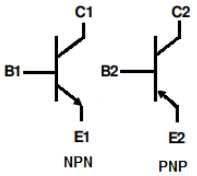
NPN/PNP General Purpose Transistor

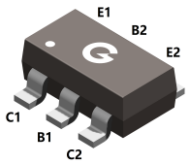
TBL2045-6L

Features

HF

- Epitaxial planar die construction
- Two internal isolated NPN/PNP transistors in one package
- Ultra-small surface mount package
- RoHS compliant with Halogen-free
- Qualified to AEC-Q101 Standards





SOT-23-6L

Mechanical Data

- Case: SOT-23-6L
- Molding compound: UL flammability classification rating 94V-0
- Terminals: Tin-plated; solderability per MIL-STD-202, Method 208

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
TBL2045-6L	SOT-23-6L	3000 pcs / Tape & Reel	2045

Maximum Ratings (@ T_A = 25°C unless otherwise specified)

Parameter	Symbol	NPN	PNP	Unit
Collector-Base Voltage	V_{CBO}	40	-40	V
Collector-Emitter Voltage	V_{CEX}	40	-40	V
Collector-Emitter Voltage	V_{CEO}	30	-30	V
Emitter-Base Voltage	V_{EBO}	7	-7	V
Collector Current (Continuous)	I_C	1.5	-1.5	A
Collector Current (Pulse)	I_{CM}	5	-5	A
Base Current	I_B	1	-1	A

Thermal Characteristics

Parameter	Symbol	Value	Unit
Power Dissipation (T_A = 25°C)	P_D	350	mW
Thermal Resistance Junction-to-Air	$R_{\theta JA}$	357	°C/W
Operating Junction Temperature	T_J	-55 ~ +150	°C
Storage Temperature Range	T_{STG}	-55 ~ +150	°C

Electrical Characteristics of NPN Transistor (@ T_A = 25°C unless otherwise specified)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C = 100μA, I_E = 0	40	-	-	V
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C = 10mA, I_B = 0	30	-	-	V
Collector-Emitter Breakdown Voltage	$V_{(BR)CEX}$	I_C = 1μA, $V_{BE(off)}$ = -0.5V	40	-	-	V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E = 100μA, I_C = 0	7	-	-	V
Collector Cut-off Current	I_{CBO}	V_{CB} = 32V, I_E = 0	-	-	20	nA
Collector Cut-off Current	I_{CER}	C_{CE} = 16V, R≤1kΩ	-	-	20	nA
Emitter Cut-off Current	I_{EBO}	V_{EB} = 6V, I_C = 0	-	-	20	nA
DC Current Gain *1	h_{FE}	V_{CE} = 2V, I_C = 100mA	180	-	500	-
Collector-emitter Saturation Voltage *1	$V_{CE(sat)}$	I_C = 750mA, I_B = 15mA	-	-	0.375	V
Base-emitter Saturation Voltage *1	$V_{BE(sat)}$	I_C = 750mA, I_B = 15mA	-	-	1.2	V

Electrical Characteristics of PNP Transistor (@ T_A = 25℃ unless otherwise specified)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C = -100μA, I_E = 0	-40	-	-	V
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C = -10mA, I_B = 0	-30	-	-	V
Collector-Emitter Breakdown Voltage	$V_{(BR)CEX}$	I_C = -1μA, $V_{BE(off)}$ = 0.5V	-40	-	-	V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E = -100μA, I_C = 0	-7	-	-	V
Collector Cut-off Current	I_{CBO}	V_{CB} = -32V, I_E = 0	-	-	-20	nA
Collector Cut-off Current	I_{CER}	C_{CE} = -16V, R≤1kΩ	-	-	-20	nA
Emitter Cut-off Current	I_{EBO}	V_{EB} = -6V, I_C = 0	-	-	-20	nA
DC Current Gain *1	h_{FE}	V_{CE} = -2V, I_C = -100mA	180	-	500	-
Collector-emitter Saturation Voltage *1	$V_{CE(sat)}$	I_C = -750mA, I_B = -15mA	-	-	-0.375	V
Base-emitter Saturation Voltage *1	$V_{BE(sat)}$	I_C = -750mA, I_B = -15mA	-	-	-1.2	V

Note 1: Pulse test: Pulse Width≤300μs, Duty Cycle≤2%

Ratings and Characteristic Curves-NPN (@ T_A = 25℃ unless otherwise specified)

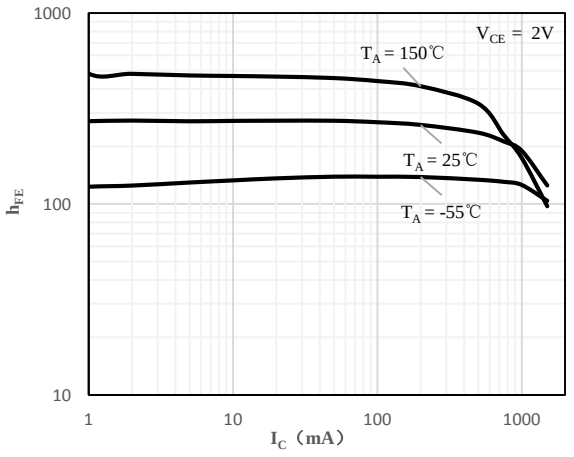


Fig 1 h_{FE} vs. I_C

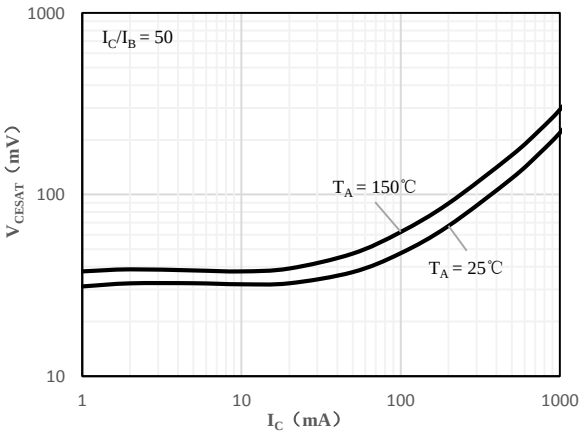


Fig 2 $V_{CE(sat)}$ vs. I_C

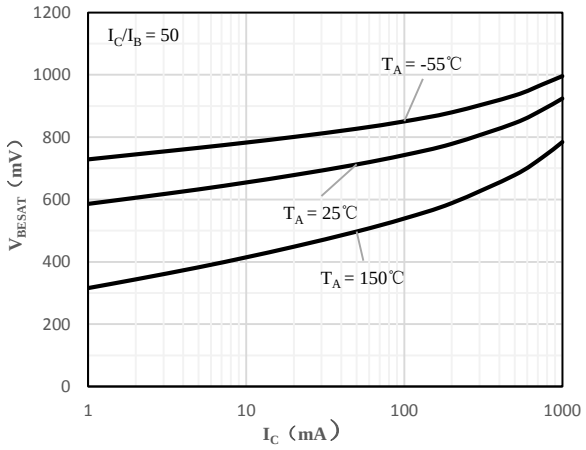


Fig 3 $V_{BE(sat)}$ vs. I_C

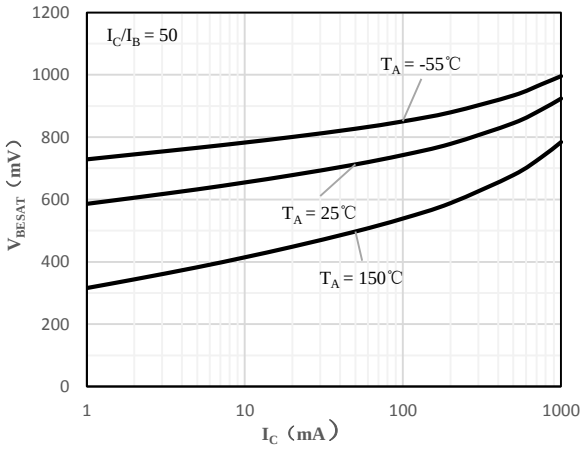


Fig 4 $V_{BE(ON)}$ vs. I_C

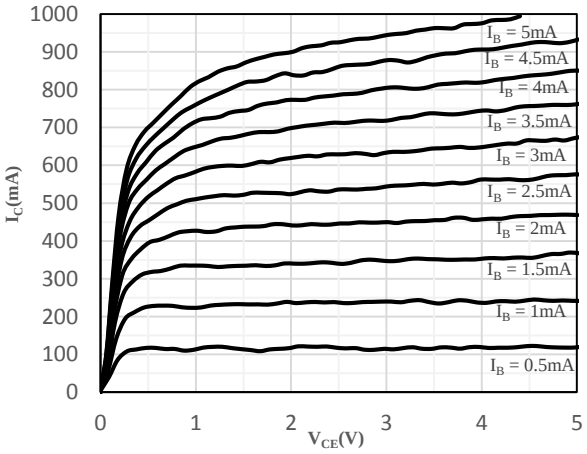


Fig 5 I_C vs. V_{CE}

Ratings and Characteristic Curves-PNP (@ T_A = 25℃ unless otherwise specified)

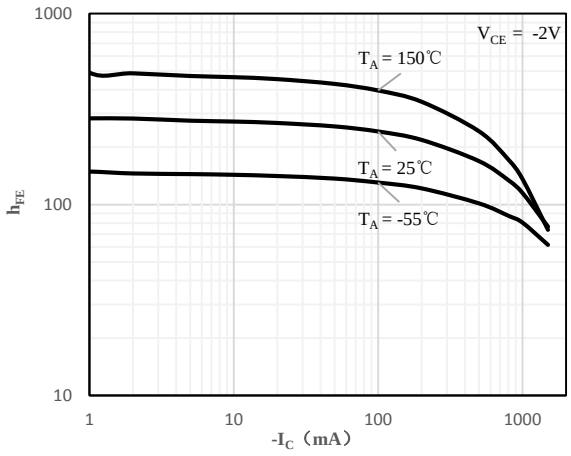


Fig 1 h_{FE} vs. I_C

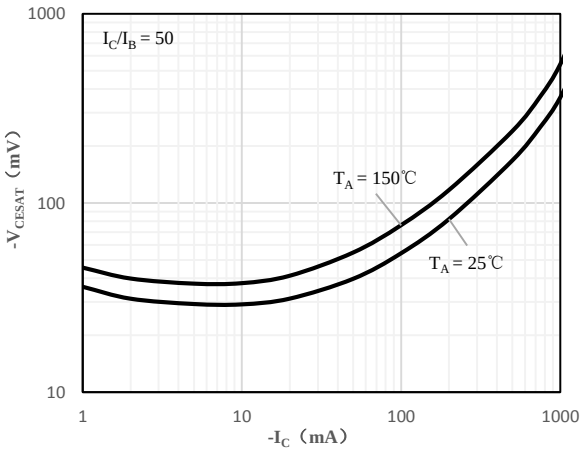


Fig 2 $V_{CE(sat)}$ vs. I_C

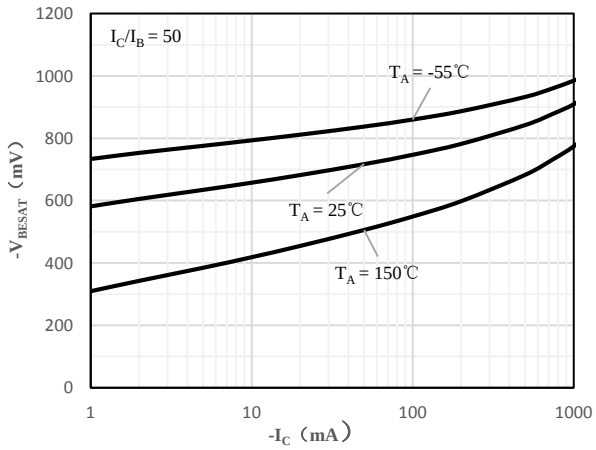


Fig 3 $V_{BE(sat)}$ vs. I_C

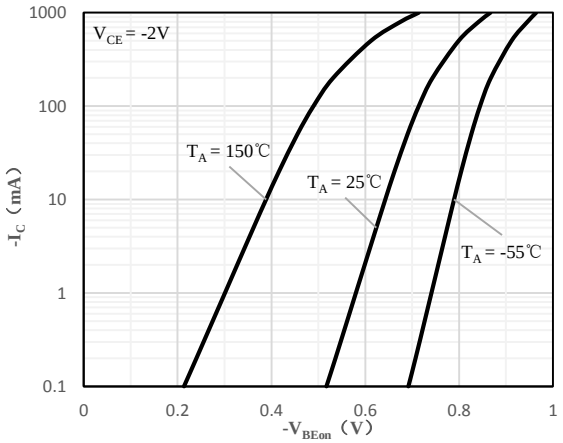


Fig 4 $V_{BE(ON)}$ vs. I_C

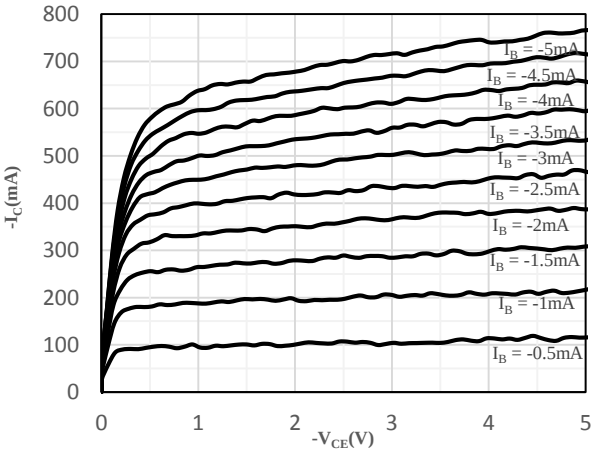
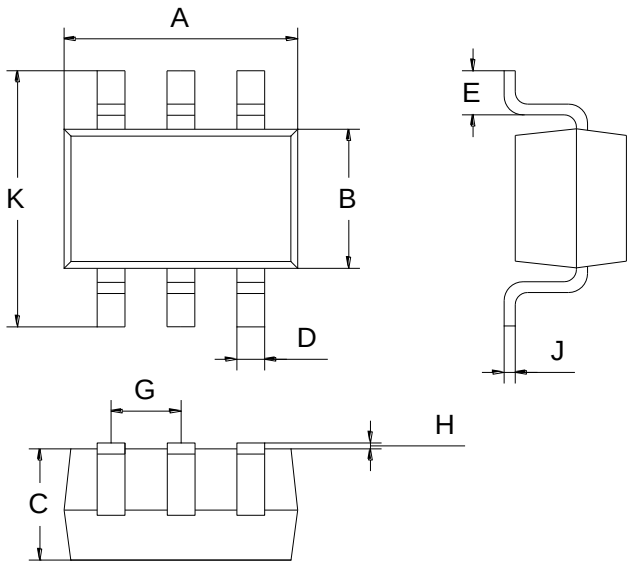


Fig 5 I_C vs. V_{CE}

Package Outline Dimensions (Unit: mm)



SOT-23-6L		
Dimension	**Min.**	**Max.**
A	2.80	3.00
B	1.50	1.70
C	1.00	1.20
D	0.35	0.45
E	0.35	0.55
G	0.90	1.00
H	0.02	0.10
J	0.10	0.20
K	2.60	3.00

Mounting Pad Layout (Unit: mm)

SOT-23-6L

