

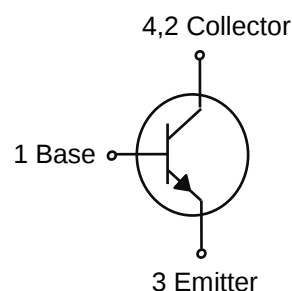
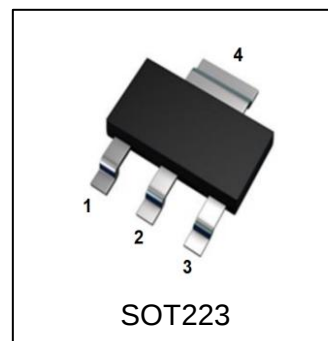
LBTN560Z4TZHG

S-LBTN560Z4TZHG

60 V NPN transistor

1. FEATURES

- Low collector-emitter saturation voltage.
- High collector current capability.
- High collector current gain.
- High efficiency due to less heat generation.
- Smaller required Printed-Circuit Board (PCB) area.
- We declare that the material of product compliance with RoHS requirements and Halogen Free.
- S- prefix for automotive and other applications requiring unique site and control change requirements; AEC-Q101 qualified and PPAP capable.

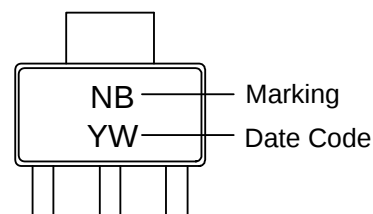


2. DEVICE MARKING AND ORDERING INFORMATION

Device	Marking	Shipping
LBTN560Z4TZHG	NB	4000/Tape&Reel

3. MAXIMUM RATINGS(Ta = 25°C)

Parameter	Symbol	Limits	Unit
Collector–Emitter Voltage	VCEO	60	V
Collector–Base Voltage	VCBO	60	V
Emitter–Base Voltage	VEBO	5	V
Collector Current — Continuous	IC	5.2	A
Peak Collector Current (tp ≤ 1 ms)	ICM	10.4	A
Junction and Storage temperature	TJ,Tstg	–55~+150	°C



4. THERMAL CHARACTERISTICS

Parameter	Symbol	Limits	Unit
Total Device Dissipation, FR-4 Board (Note 1) @ TA = 25°C	PD	1	W
Thermal Resistance, Junction–to–Ambient(Note 1)	RθJA	125	°C/W
Thermal Resistance, Junction–to–Case	RθJC	30	°C/W

1. FR-4 = 30.0mm×25.0mm×1.6mm.

5. ELECTRICAL CHARACTERISTICS (Ta= 25°C)

OFF CHARACTERISTICS

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Collector–Emitter Breakdown Voltage (IC = 1 mA, IB = 0)	VBR(CEO)	60	-	-	V
Collector–Base Breakdown Voltage (IC = 100 μ A, IE = 0)	VBR(CBO)	60	-	-	V
Emitter–Base Breakdown Voltage (IE = 100 μ A, IC = 0)	VBR(EBO)	5	-	-	V
Collector Cutoff Current (VCB = 60V, IE = 0 A) (VCB = 60V, IE = 0 A, Tj = 150 °C)	ICBO	-	-	100 50	nA μ A
Emitter CutOff Current (VEB = 5 V, IC = 0 A)	IEBO	-	-	100	nA
Collector-Emitter cutoff Current (VCE= 60V, IB=0)	ICEO	-	-	10	μ A

ON CHARACTERISTICS (Note 2)

DC Current Gain (VCE = 2 V, IC = 0.5 A) (VCE = 2 V, IC = 1 A) (VCE = 2 V, IC = 2 A) (VCE = 2 V, IC = 4 A) (VCE = 2 V, IC = 6 A)	HFE	300 300 250 150 80	520 500 470 250 120	- - - - -	
Collector–Emitter Saturation Voltage (IC = 0.5 A, IB = 50 mA) (IC = 1 A, IB = 50 mA) (IC = 1 A, IB = 10 mA) (IC = 2 A, IB = 40 mA) (IC = 4 A, IB = 200 mA) (IC = 4 A, IB = 400 mA) (IC = 4 A, IB = 80 mA) (IC = 5.2 A, IB = 260 mA)	VCE(sat)	- - - - - - - -	25 50 85 105 155 145 205 200	35 70 120 150 220 210 305 280	mV
Base–Emitter Saturation Voltage (IC = 1 A, IB = 100 mA) (IC = 4 A, IB = 400 mA)	VBE(sat)	- -	0.82 0.94	0.9 1.05	V
Base-Emitter Turn-On Voltage (VCE = 2 V, IC = 2 A)	VBE(on)	-	0.75	0.85	V

5. ELECTRICAL CHARACTERISTICS (Ta= 25°C)

SMALL-SIGNAL CHARACTERISTICS

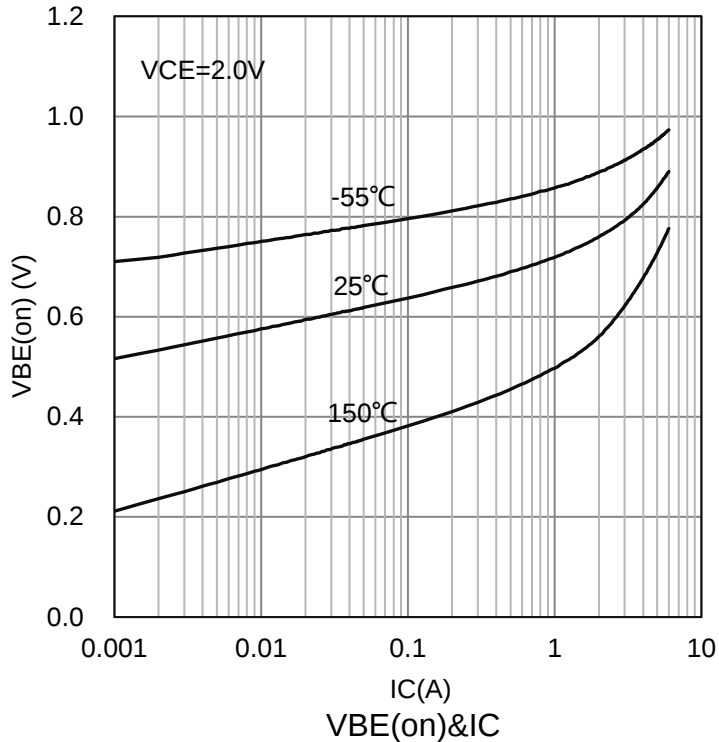
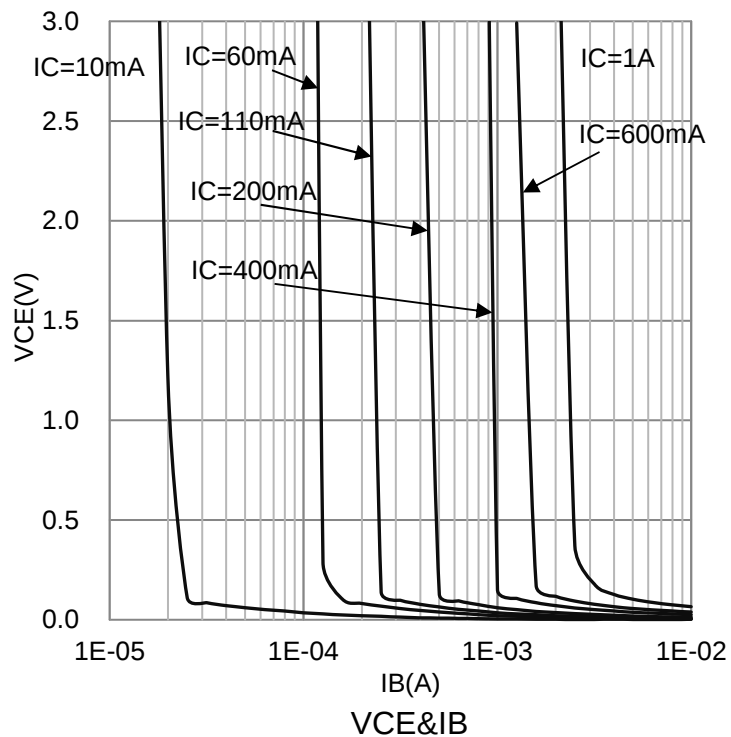
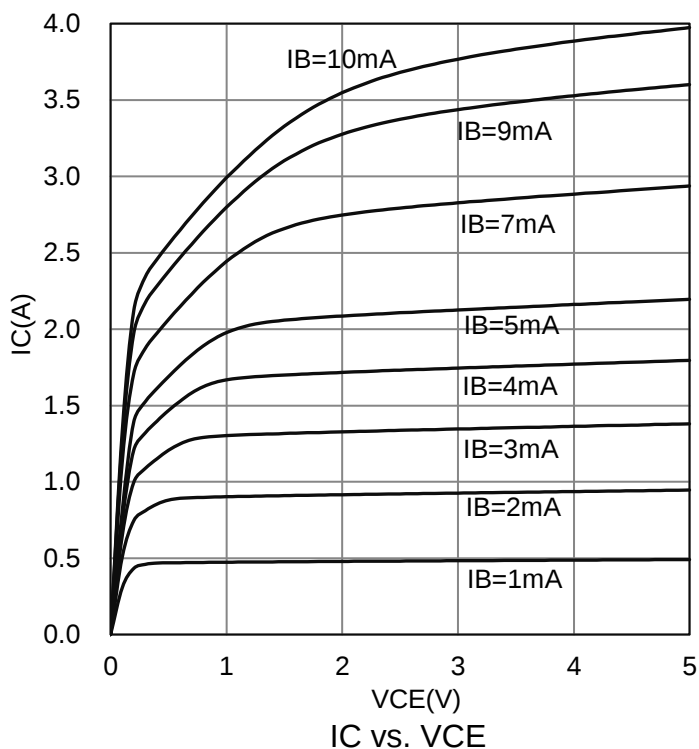
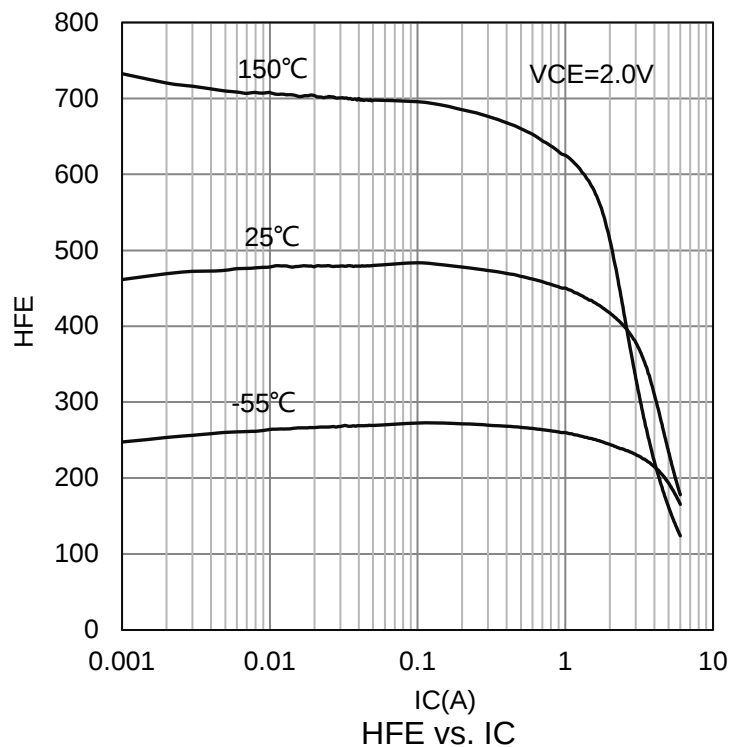
Transitional Frequency (VCE = 10 V, IC = 100 mA, f = 100 MHz)	fT	-	130	-	MHz
Collector Capacitance (VCB = 10 V, IE = ie = 0 A, f = 1 MHz)	Cc	-	48	70	pF

SWITCHING CHARACTERISTICS

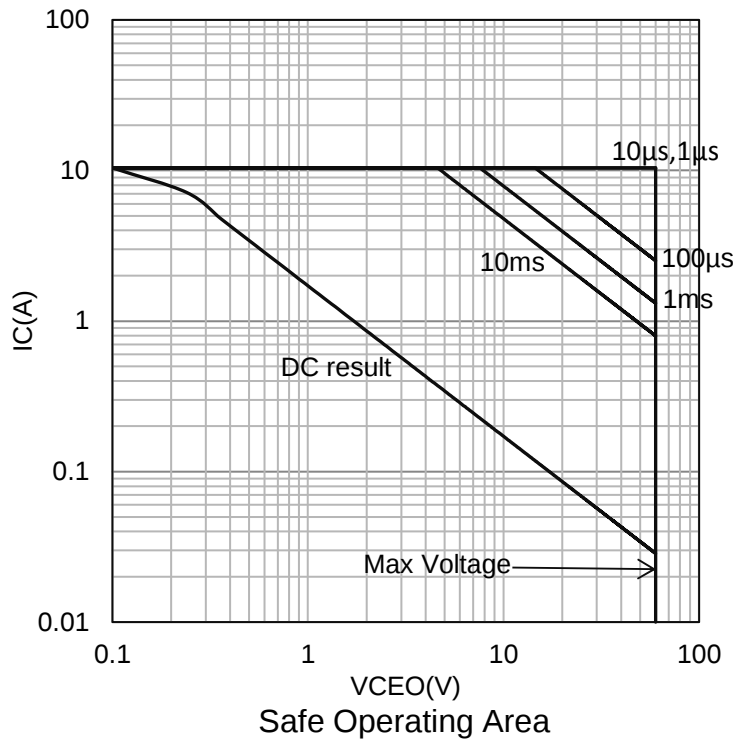
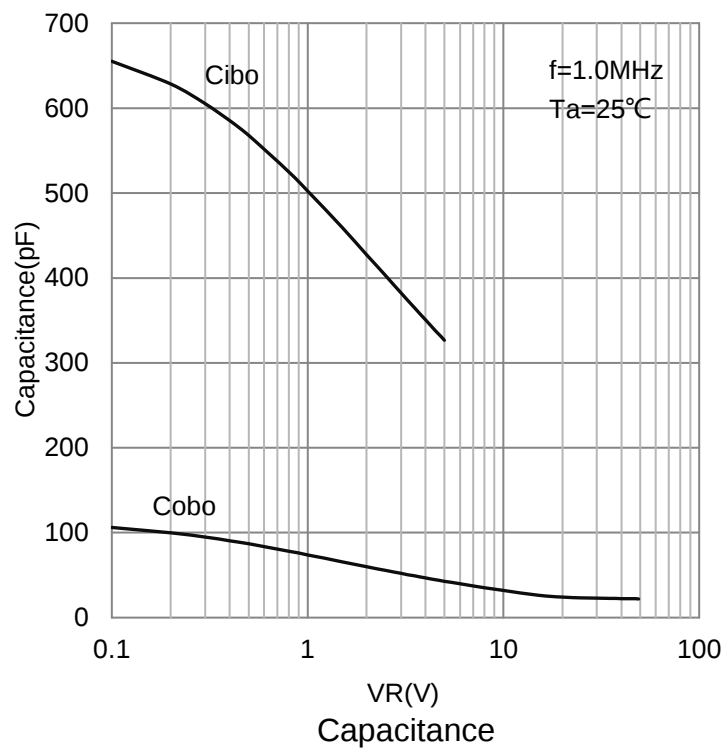
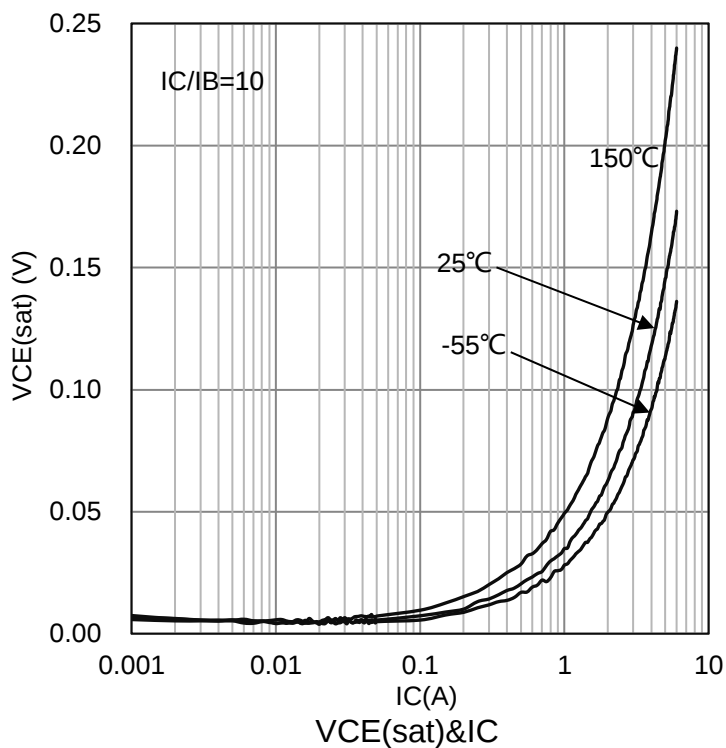
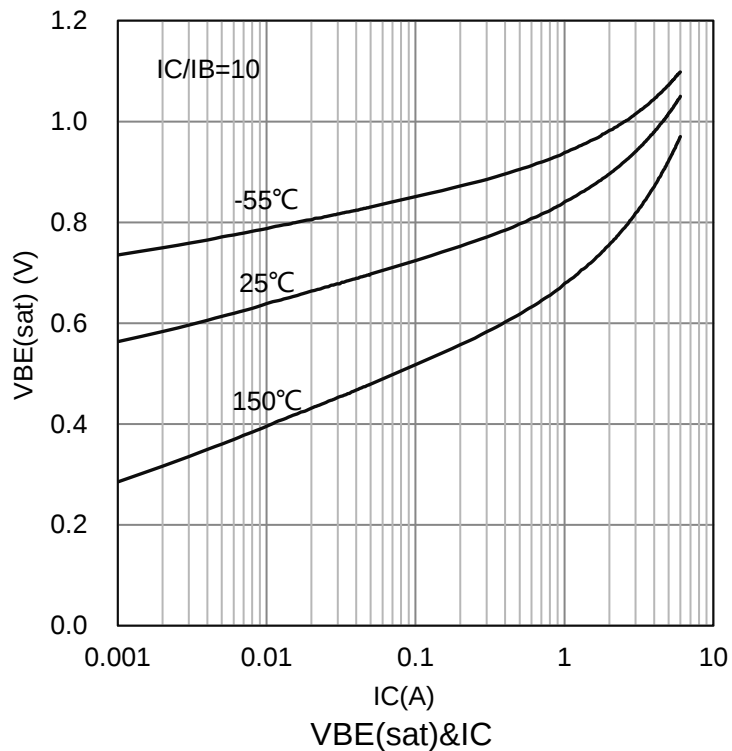
Delay time	(VCC = 12.5 V, IC = 3 A, IB(on) = 0.15 A, IB(off) = -0.15 A)	td	-	15	-	ns
Rise time		tr	-	95	-	
Turn-on time		ton	-	110	-	
Storage time		ts	-	360	-	
Fall time		tf	-	195	-	
Turn-off time		toff	-	555	-	

2. Pulse Test: Pulse Width $\leq 300 \mu\text{s}$, Duty Cycle $\leq 2.0\%$.

6.ELECTRICAL CHARACTERISTICS CURVES

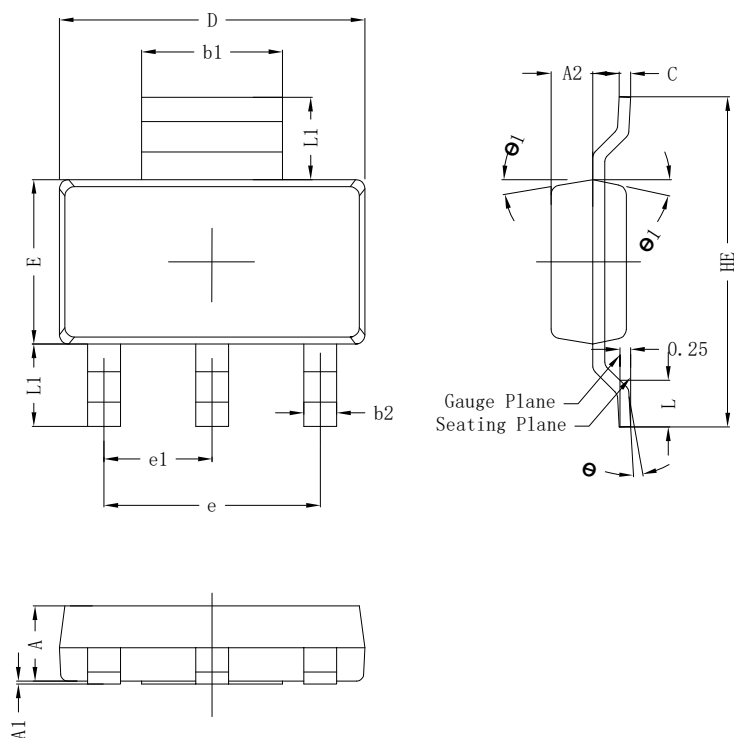


6.ELECTRICAL CHARACTERISTICS CURVES(Con.)



7.OUTLINE AND DIMENSIONS

SOT223

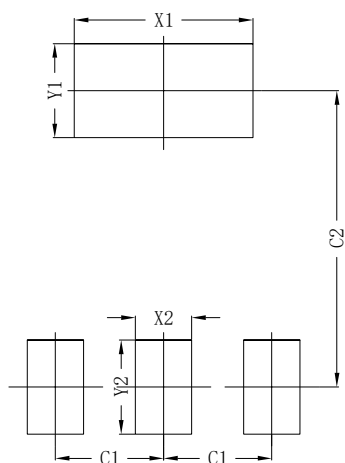


SOT223			
DIM	MIN	NOR	MAX
A	1.50	1.60	1.70
A1	0.00	0.05	0.10
A2	0.80	0.90	1.00
b1	2.90	3.02	3.10
b2	0.60	0.72	0.80
c	0.20	0.27	0.35
D	6.30	6.50	6.70
E	3.30	3.50	3.70
e	4.60BSC		
e1	2.30BSC		
HE	6.80	7.00	7.20
L	0.80	1.00	1.20
L1	1.75(REF)		
θ	0°~8°		
θ 1	8°	10°	12°
All Dimensions in mm			

GENERAL NOTES

1. Top package surface finish $Ra0.4 \pm 0.2\mu m$
2. Bottom package surface finish $Ra0.7 \pm 0.2\mu m$
3. Side package surface finish $Ra0.4 \pm 0.2\mu m$
4. Protrusion or Gate Burrs shall not exceed 0.10mm per side.

8.SOLDERING FOOTPRINT



SOT223	
DIM	(mm)
X1	3.80
Y1	2.00
X2	1.20
Y2	2.00
C1	2.30
C2	6.30

DISCLAIMER

- Curve guarantee in the specification. The curve of test items with electric parameter is used as quality guarantee. The curve of test items without electric parameter is used as reference only.
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