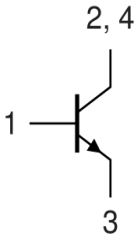
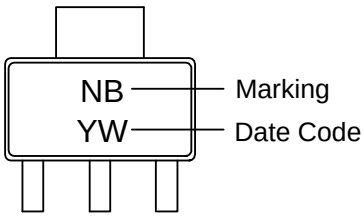
LBTN560Z4TZHG
S-LBTN560Z4TZHG

60 V NPN transistor

SOT223





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	1000/Tape&Reel

3. MAXIMUM RATINGS(Ta = 25ºC)

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	ºC

4. THERMAL CHARACTERISTICS

Parameter	Symbol	Limits	Unit
Total Device Dissipation, FR−4 Board (Note 1) @ TA = 25ºC	PD	1	W
Thermal Resistance, Junction–to–Ambient(Note 1)	RΘJA	125	ºC/W
Thermal Resistance, Junction–to–Case	RΘJC	30	ºC/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 μA,IE = 0)	VBR(CBO)	60	-	-	V
Emitter–Base Breakdown Voltage (IE = 100 μA,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 μA
Emitter CutOff Current (VEB = 5 V, IC = 0 A)	IEBO	-	-	100	nA
Collector-Emitter cutoff Current (VCE= 60V,IB=0)	ICEO	-	-	10	μA

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

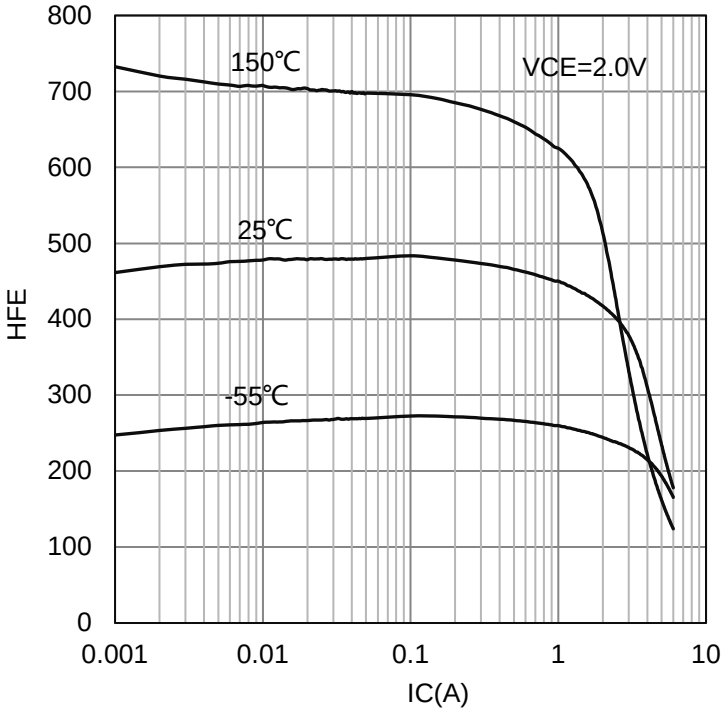
Transitional Frequency (VCE = 10 V, IC = 100 mA ,f = 100 MHz)	fT	-	130	-	MHz
Collector Capacitance (VCB = 10 V, IE = ie = 0 A,f = 1 MHz)	Cc	-	48	70	pF

SWITCHING CHARACTERISTICS

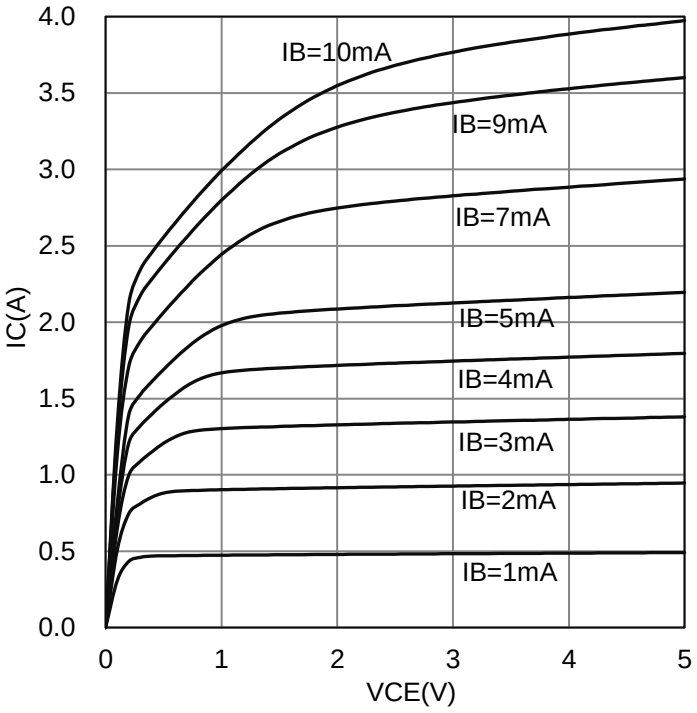
Delay time	(VCC = 12.5 V, IC = 3 A,IB(on)= 0.15 A,IB(off) = −0.15 A)	td	-	15	-	ns
Rise time		tr	-	95	-	
Turn-on time		ton	-	110	-	
Storage time		ts	-	360	-	
Fall time		tf	-	195	-	
Turn-off time		toff	-	555	-	

2.Pulse Test: Pulse Width ≤300 μs, Duty Cycle ≤2.0%.

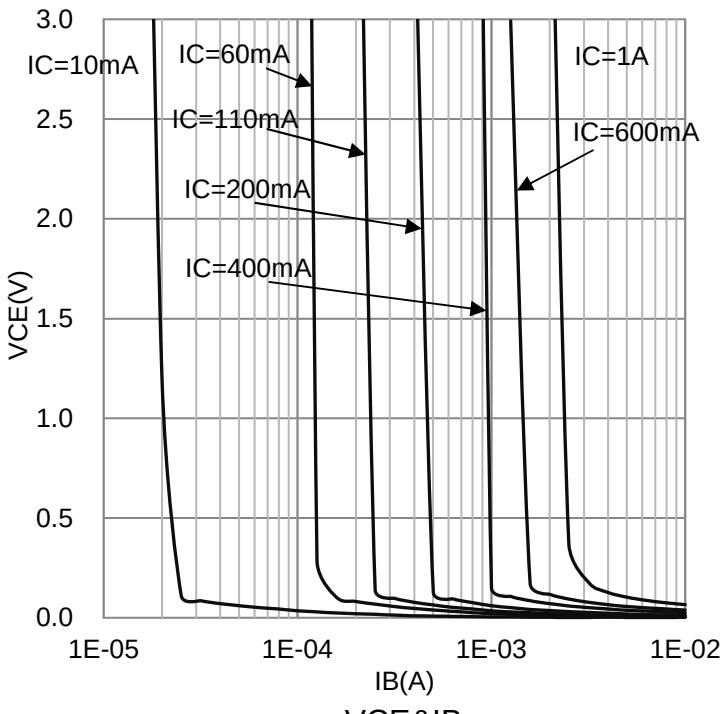
6.ELECTRICAL CHARACTERISTICS CURVES



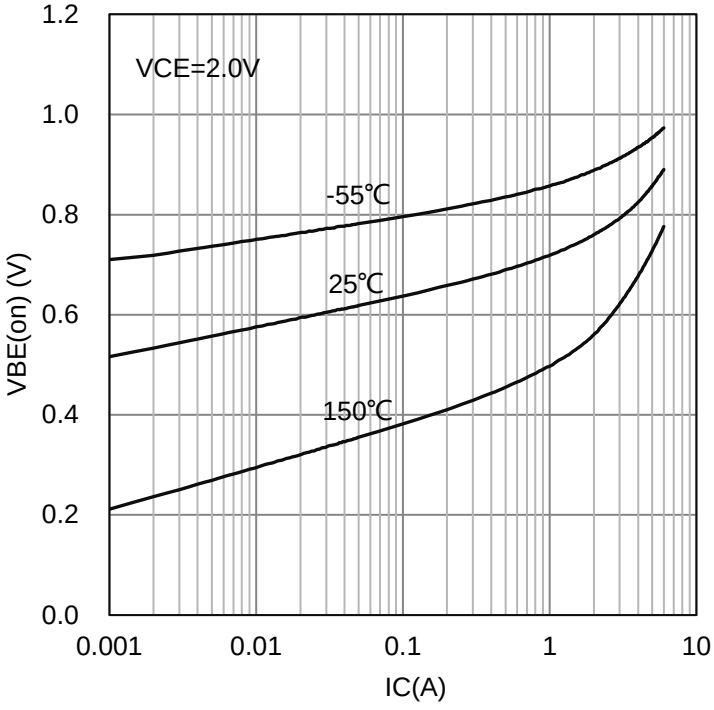
HFE vs. IC



IC vs. VCE

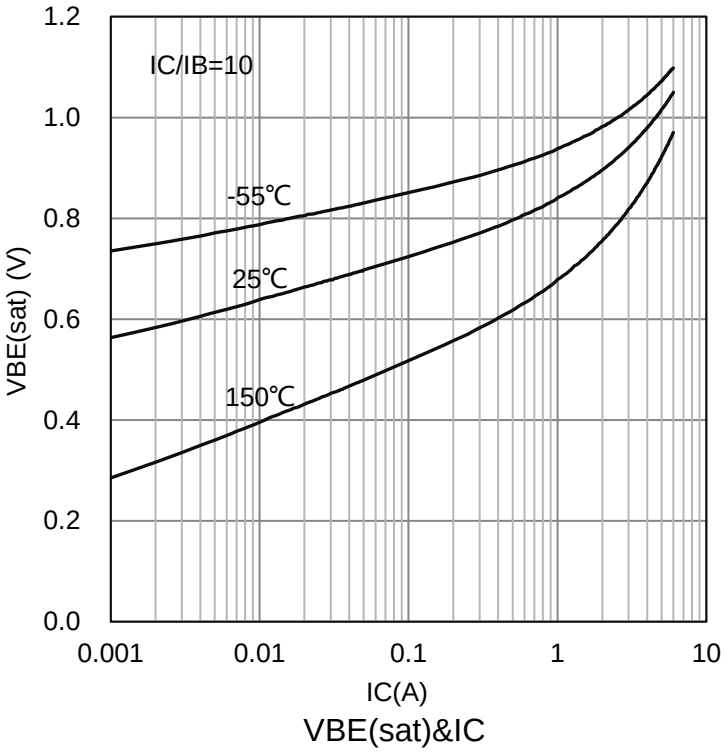


VCE&IB

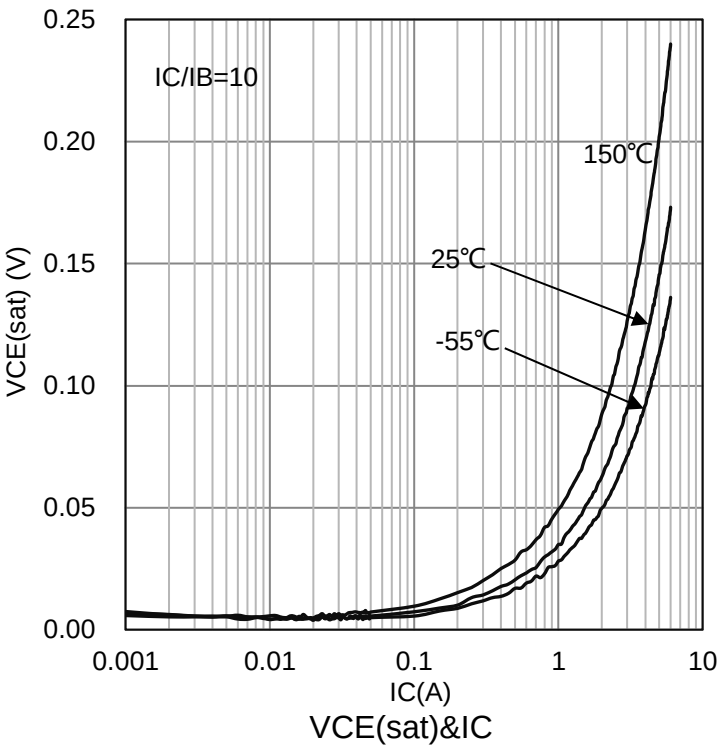


VBE(on)&IC

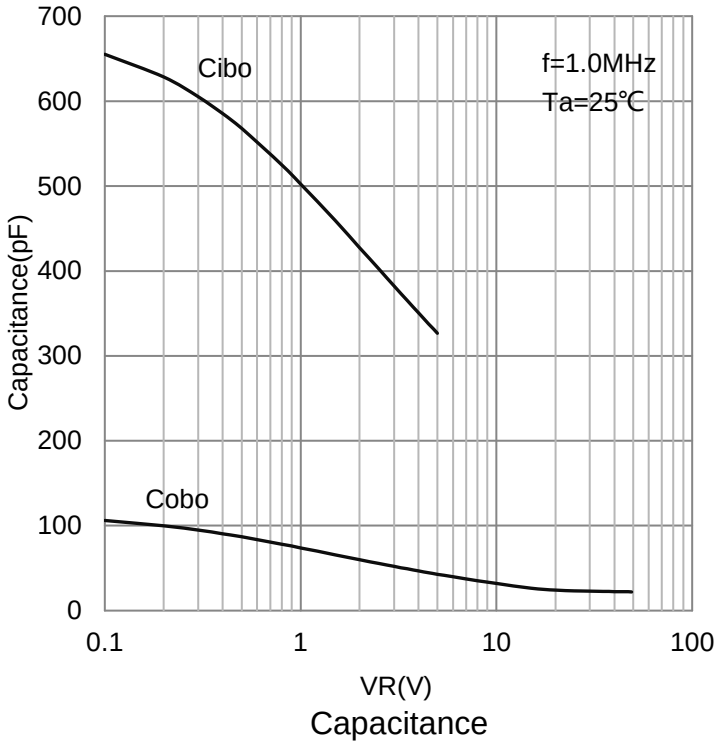
6.ELECTRICAL CHARACTERISTICS CURVES(Con.)



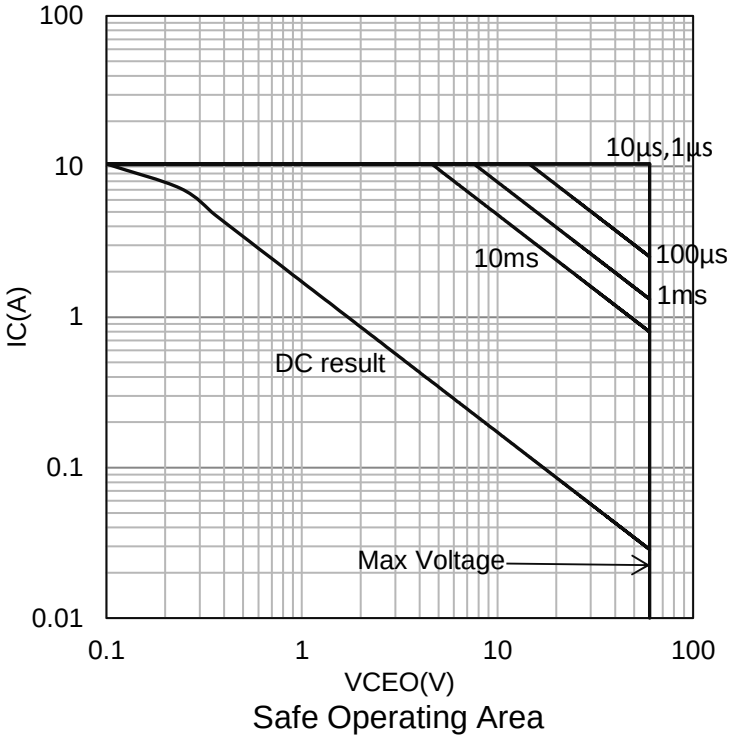
VBE(sat)&IC



VCE(sat)&IC



Capacitance



Safe Operating Area

7.OUTLINE AND DIMENSIONS

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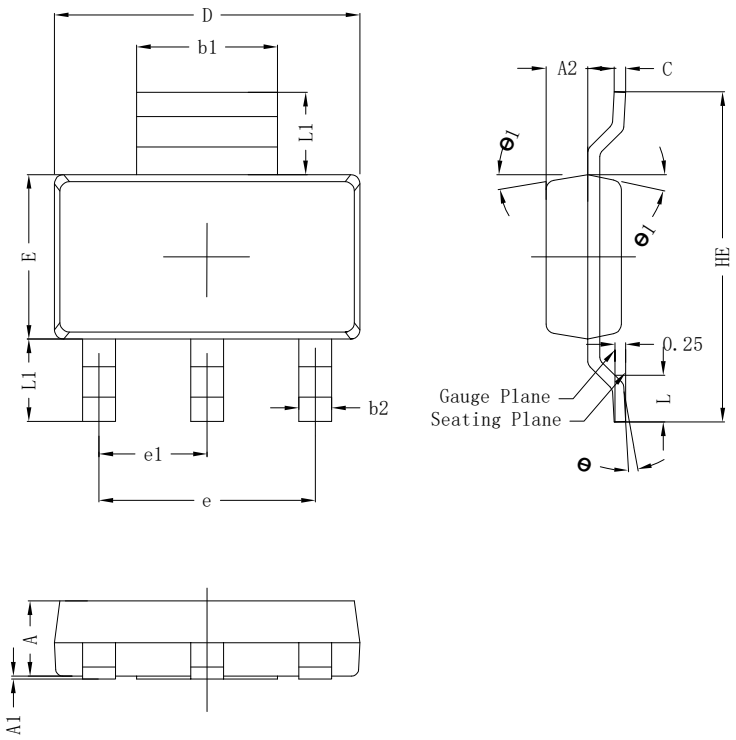
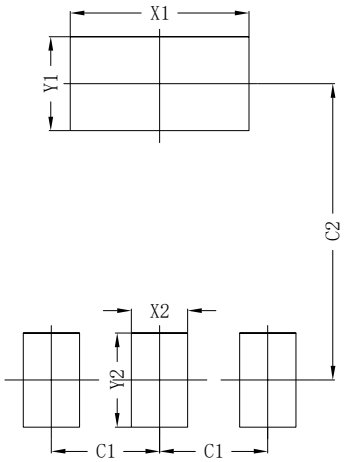


SOT223			
DIM	MIN	NOR	MAX
A	1.50	1.60	1.70
A1	0.00	0.05	0.10
A2	0.80	0.90	1.00
b1	2.90	3.02	3.10
b2	0.60	0.72	0.80
c	0.20	0.27	0.35
D	6.30	6.50	6.70
E	3.30	3.50	3.70
e	4.60BSC		
e1	2.30BSC		
HE	6.80	7.00	7.20
L	0.80	1.00	1.20
L1	1.75(REF)		
θ	0°~8°		
θ1	8°	10°	12°
All Dimensions in mm			

GENERAL NOTES

1. Top package surface finish Ra0.4±0.2um
2. Bottom package surface finish Ra0.7±0.2um
3. Side package surface finish Ra0.4±0.2um
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

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