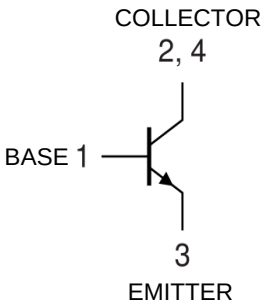
LBTN5100Z4TZHG
S-LBTN5100Z4TZHG

100 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
LBTN5100Z4TZHG	ND	4000/Tape&Reel

3. MAXIMUM RATINGS(Ta = 25ºC)

Parameter	Symbol	Limits	Unit
Collector–Emitter Voltage	VCEO	100	V
Collector–Base Voltage	VCBO	100	V
Emitter–Base Voltage	VEBO	5	V
Collector Current — Continuous	IC	5.1	A
Peak Collector Current (tp ⩽ 1 ms)	ICM	10.2	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	833	mW
Thermal Resistance, Junction–to–Ambient(Note 1)	RΘJA	150	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=1mA,IB=0)	VBR(CEO)	100	-	-	V
Collector–Base Breakdown Voltage (IC=100μA,IE=0)	VBR(CBO)	100	-	-	V
Emitter–Base Breakdown Voltage (IE=100μA,IC=0)	VBR(EBO)	5	-	-	V
Collector Cutoff Current (VCB = 80V, IE = 0 A) (VCB = 80V, 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 (IB=0, VCE=80V)	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 = 5 A)	HFE	 200 150 100 50 30	 330 270 175 85 60	 - - - - -	
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 = 5.1 A, IB = 255 mA)	VCE(sat)	 - - - - - - -	 27 53 100 115 170 155 215	 40 75 150 165 240 220 300	 mV
Base–Emitter Saturation Voltage (IC = 1 A, IB = 100 mA) (IC = 4 A, IB = 400 mA)	VBE(sat)	 - -	 0.81 0.94	 0.9 1.05	 V
Base-Emitter Turn-On Voltage (VCE = 2 V, IC = 2 A)	VBE(on)	-	0.78	0.85	V

SMALL–SIGNAL CHARACTERISTICS

Transitional Frequency (VCE = 10 V, IC = 100 mA ,f = 100 MHz)	fT	-	134	-	MHz
Collector Capacitance (VCB = 10 V, IE = ie = 0 A,f = 1 MHz)	Cc	-	23	40	pF

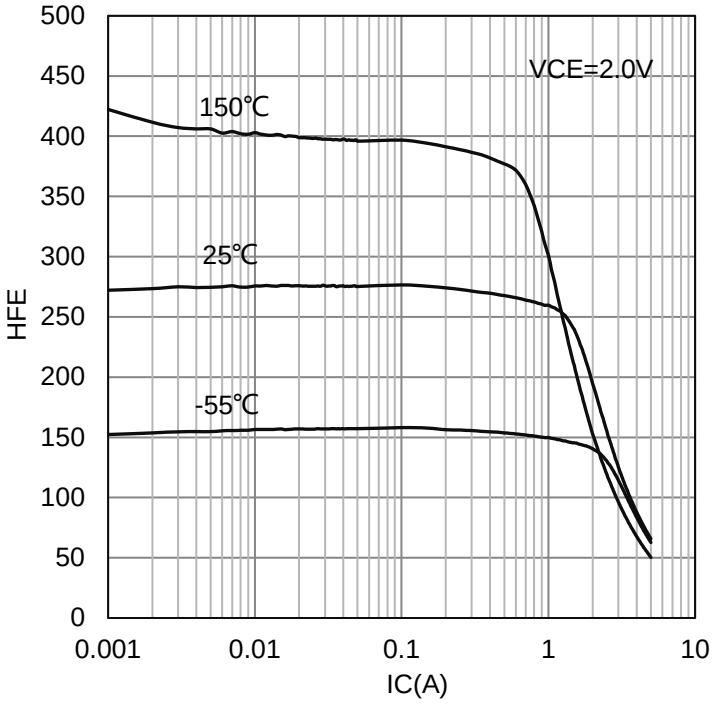
5. ELECTRICAL CHARACTERISTICS (Ta= 25°C)

SWITCHING CHARACTERISTICS

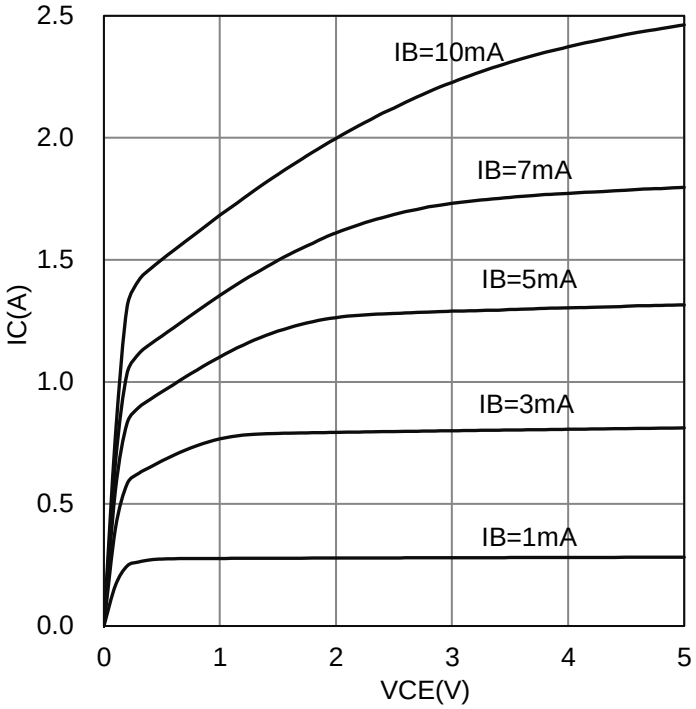
Delay time	(VCC = 12.5 V, IC = 3 A,IB(on)= 0.15 A,IB(off) = −0.15 A)	td	-	44	-	ns
Rise time		tr	-	156	-	
Turn-on time		ton	-	200	-	
Storage time		ts	-	700	-	
Fall time		tf	-	178	-	
Turn-off time		toff	-	883	-	

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

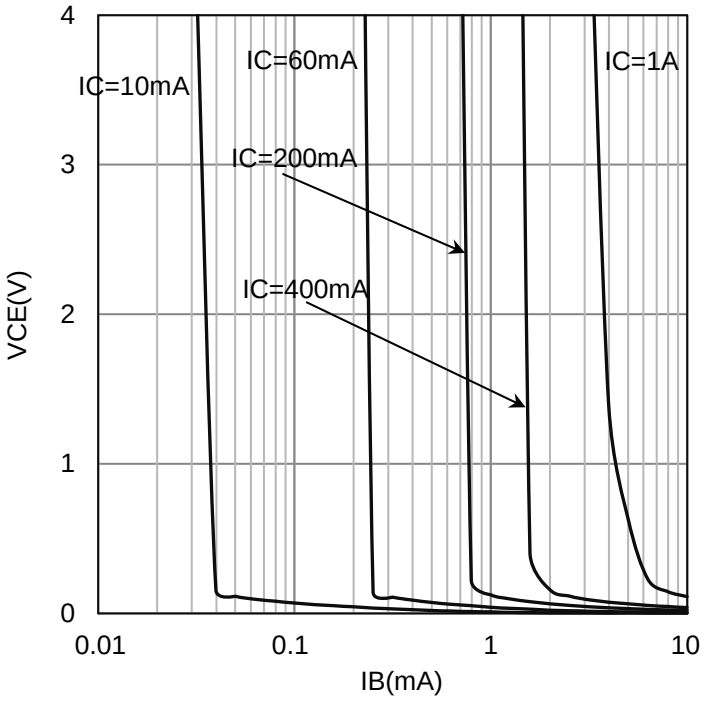
6.ELECTRICAL CHARACTERISTICS CURVES



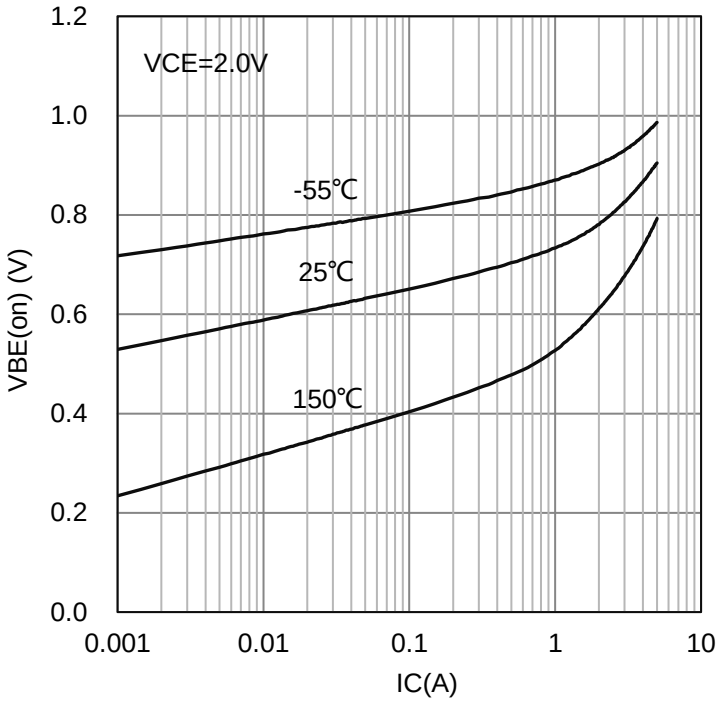
HFE vs. IC



IC vs. VCE

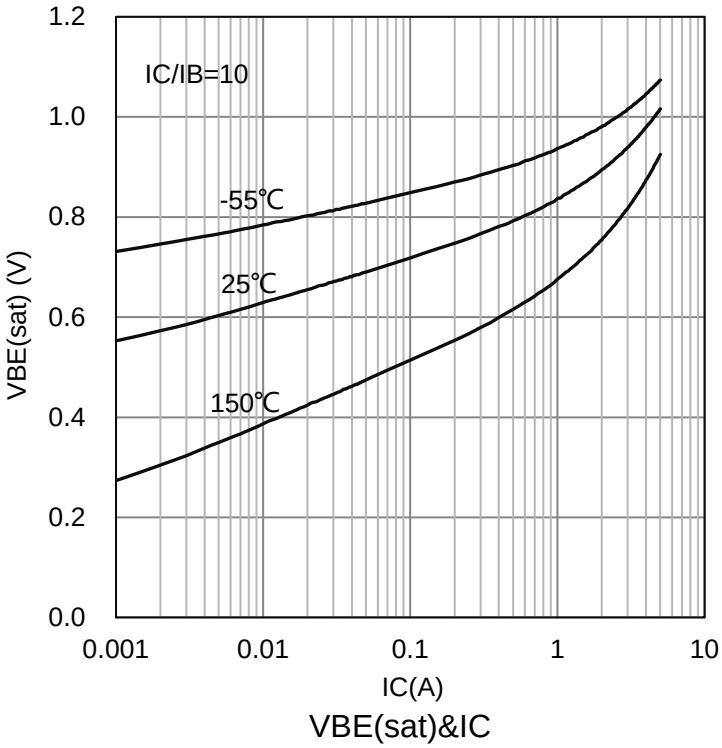


VCE&IB

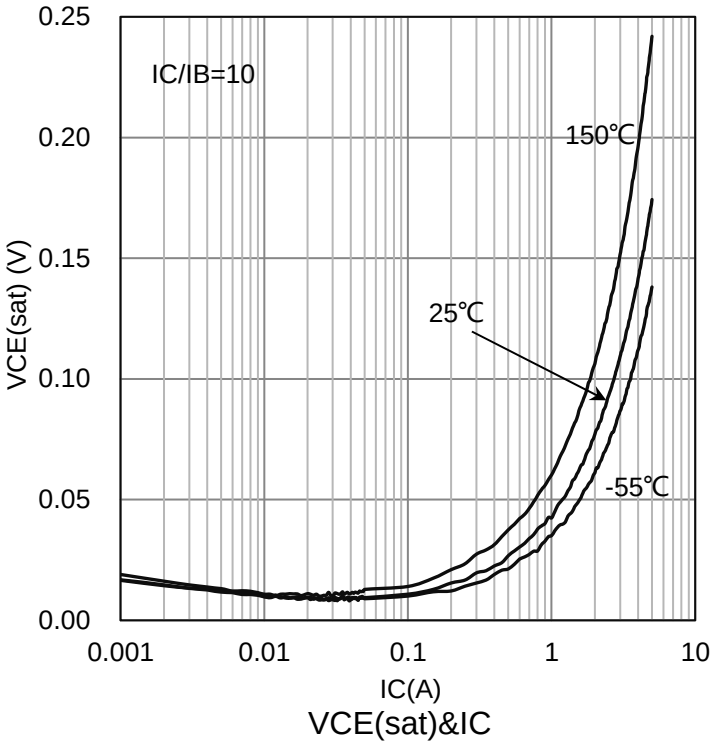


VBE(on)&IC

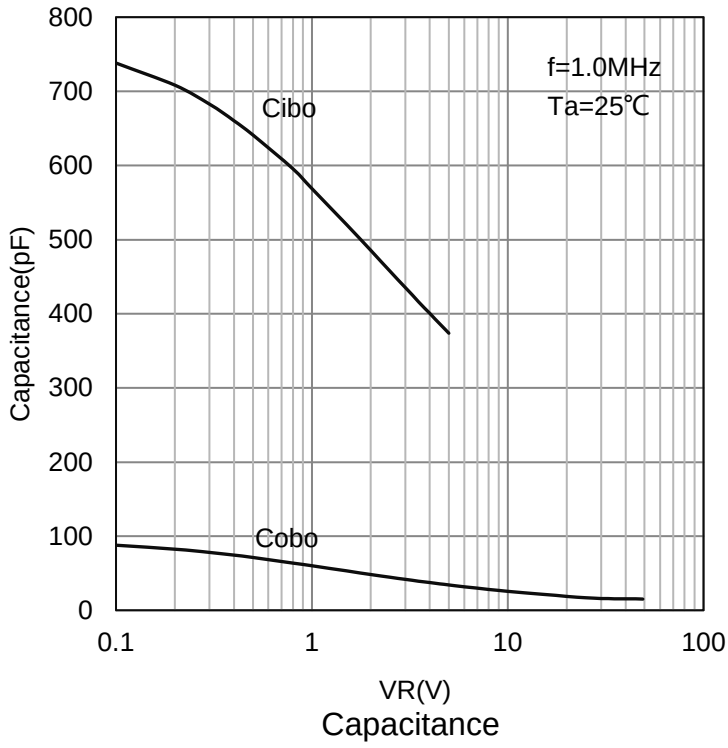
6.ELECTRICAL CHARACTERISTICS CURVES(Con.)



VBE(sat)&IC



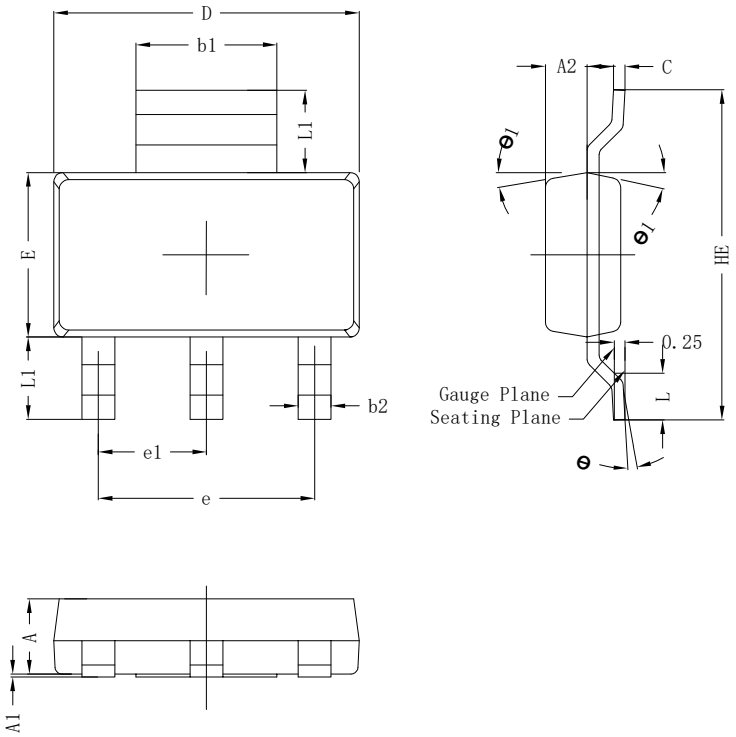
VCE(sat)&IC



Capacitance

7.OUTLINE AND DIMENSIONS

SOT223

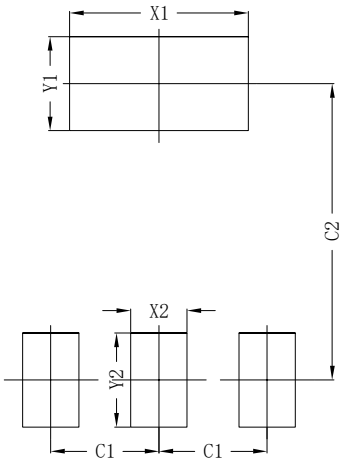


SOT223			
DIM	MIN	NOR	MAX
A	1.50	1.60	1.70
A1	0.00	0.05	0.10
A2	0.80	0.90	1.00
b1	2.90	3.02	3.10
b2	0.60	0.72	0.80
c	0.20	0.27	0.35
D	6.30	6.50	6.70
E	3.30	3.50	3.70
e	4.60BSC		
e1	2.30BSC		
HE	6.80	7.00	7.20
L	0.80	1.00	1.20
L1	1.75(REF)		
θ	0°~8°		
θ 1	8°	10°	12°
All Dimensions in mm			

GENERAL NOTES

1. Top package surface finish Ra0.4±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

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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