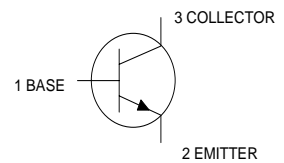
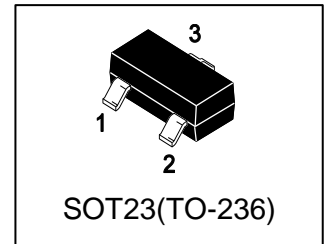


# LMBT2222ALT1G

## S-LMBT2222ALT1G

General Purpose Transistors NPN Silicon



### 1. FEATURES

- 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
LMBT2222ALT1G	1P	3000/Tape&Reel
LMBT2222ALT3G	1P	10000/Tape&Reel

### 3. MAXIMUM RATINGS(Ta = 25°C)

Parameter	Symbol	Limits	Unit
Collector–Emitter Voltage	V <sub>CEO</sub>	40	V
Collector–Base Voltage	V <sub>CBO</sub>	75	V
Emitter–Base Voltage	V <sub>EBO</sub>	6	V
Collector Current — Continuous	I <sub>C</sub>	600	mA

### 4. THERMAL CHARACTERISTICS

Parameter	Symbol	Limits	Unit
Total Device Dissipation, FR-5 Board (Note 1) @ TA = 25°C Derate above 25°C	PD	225 1.8	mW mW/°C
Thermal Resistance, Junction–to–Ambient(Note 1)	R <sub>θJA</sub>	556	°C/W
Junction–to–Case	R <sub>θJC</sub>	300	°C/W
Junction and Storage temperature	T <sub>J</sub> , T <sub>stg</sub>	-55~+150	°C

1. FR-5 = 1.0×0.75×0.062 in.

**5. ELECTRICAL CHARACTERISTICS (Ta= 25°C)**
**OFF CHARACTERISTICS**

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Collector–Emitter Breakdown Voltage (IC = 10 mA, IB = 0)	VBR(CEO)	40	-	-	V
Collector–Base Breakdown Voltage (IC = 10 μA, IE = 0)	VBR(CBO)	75	-	-	V
Emitter–Base Breakdown Voltage (IE = 10 μA, IC = 0)	VBR(EBO)	6	-	-	V
Collector Cutoff Current (VCE = 60 V, VEB(off) = 3.0V)	ICEX	-	-	10	nA
Collector Cutoff Current (VCB = 60 V, IE = 0) (VCB = 60 V, IE = 0, TA = 125°C)	ICBO	-	-	0.01 10	μA
Emitter Cutoff Current (VEB = 3.0 V, IC = 0)	IEBO	-	-	100	nA
Collector-Emitter cutoff Current (VCE = 40V, IB=0)	ICEO	-	-	10	μA
Base Cutoff Current (VCE = 60 V, VEB(off) = 3.0 V)	IBL	-	-	20	nA

**ON CHARACTERISTICS (Note 2.)**

DC Current Gain (IC = 0.1 mA, VCE = 10 V) (IC = 1.0 mA, VCE = 10 V) (IC = 10 mA, VCE = 10 V) (IC = 10 mA, VCE = 10 V, TA= -55°C) (IC = 150 mA, VCE = 10 V) (IC = 150 mA, VCE = 1.0 V) (IC = 500 mA, VCE = 10 V)	HFE	35 50 75 35 100 50 40	- - - - - - -	- - - - 300 - -	
Collector–Emitter Saturation Voltage (IC = 150 mA, IB = 15 mA) (IC = 500 mA, IB = 50 mA)	VCE(sat)	- -	- -	0.3 1	V
Base–Emitter Saturation Voltage (IC = 150 mA, IB = 15 mA) (IC = 500 mA, IB = 50 mA)	VBE(sat)	0.6 -	- -	1.2 2	V

**SMALL–SIGNAL CHARACTERISTICS**

Current–Gain — Bandwidth Product (IC = 20mA, VCE= 20V, f = 100MHz)	fT	300	-	-	MHz
Output Capacitance (VCB = 5.0 V, IE = 0, f = 1.0 MHz)	Cobo	-	-	8	pF
Input Capacitance (VEB = 0.5 V, IC = 0, f = 1.0 MHz)	Cibo	-	-	25	pF

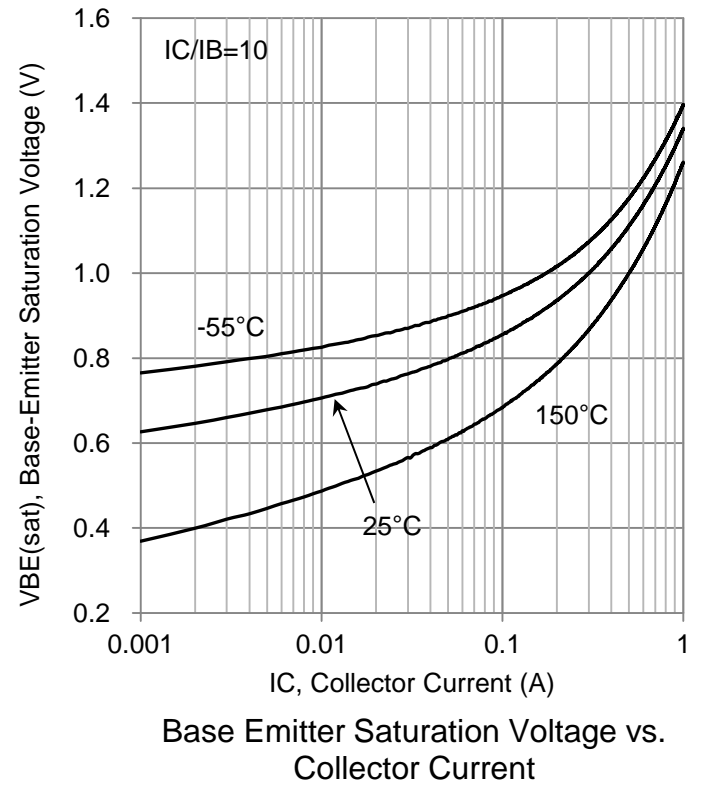
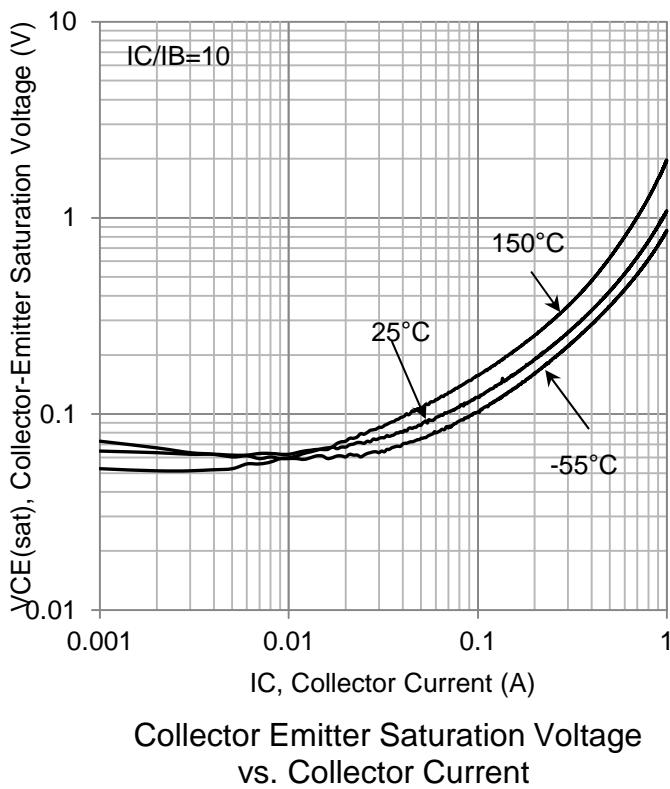
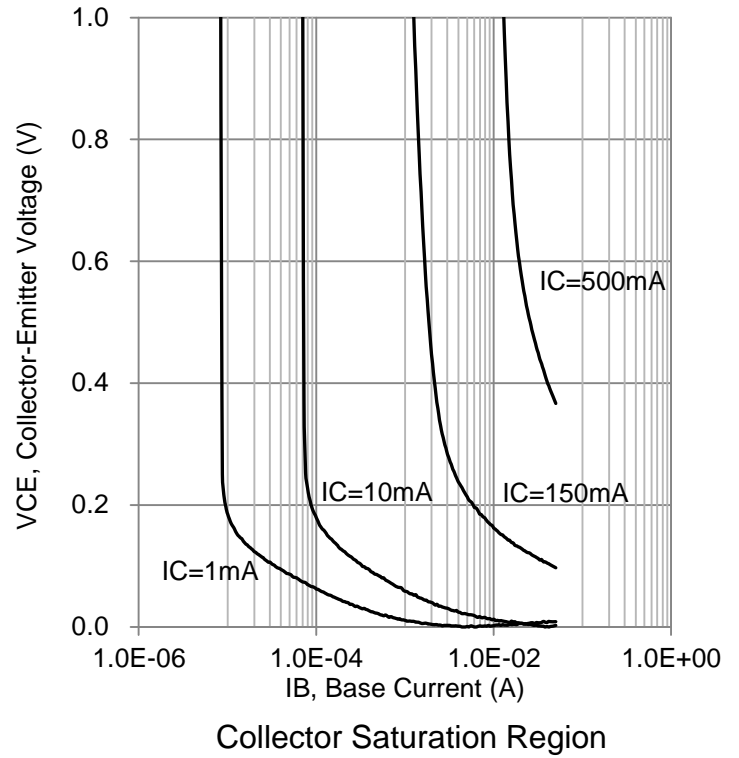
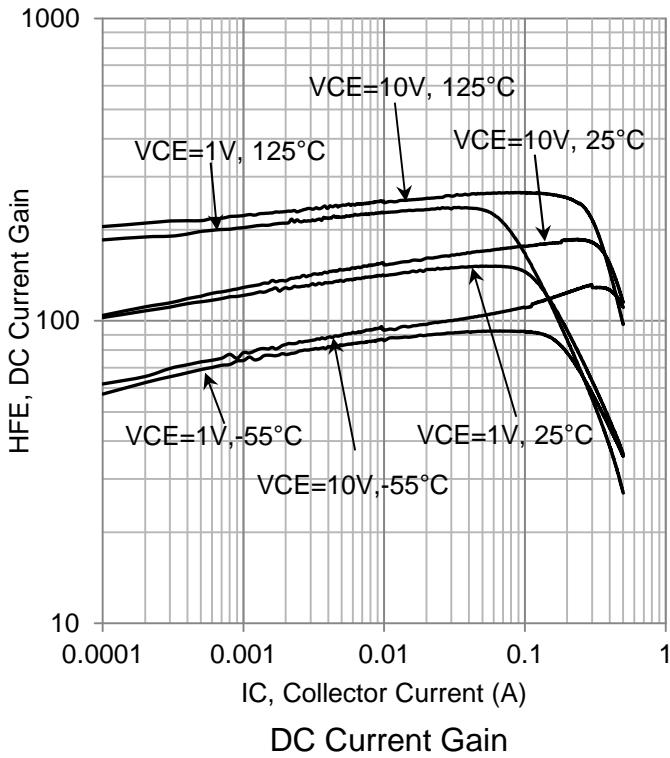
**5. ELECTRICAL CHARACTERISTICS (Ta= 25°C)**

## SWITCHING CHARACTERISTICS

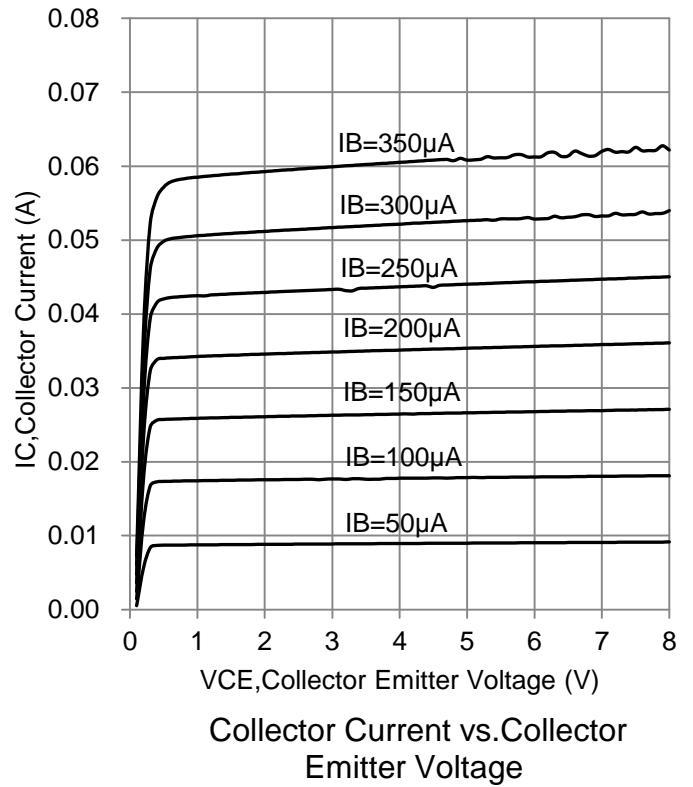
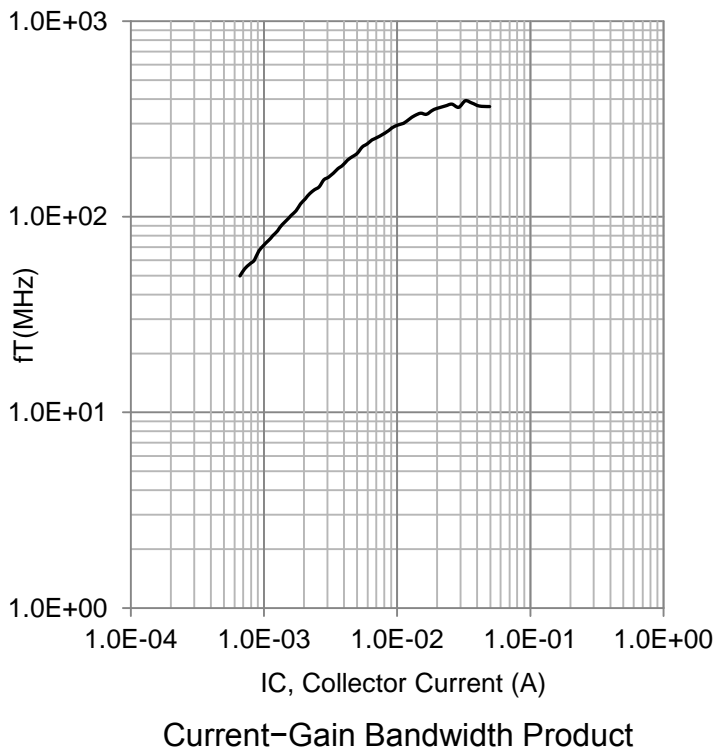
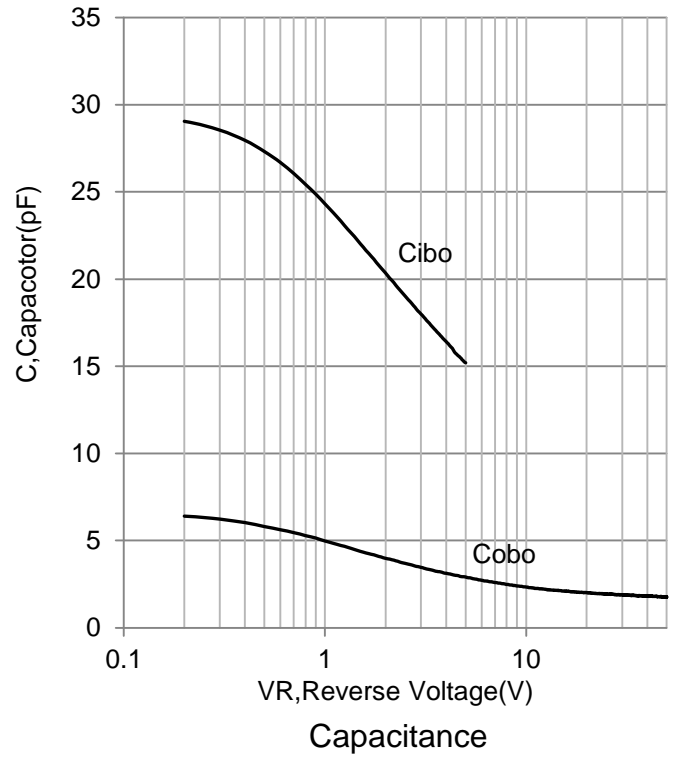
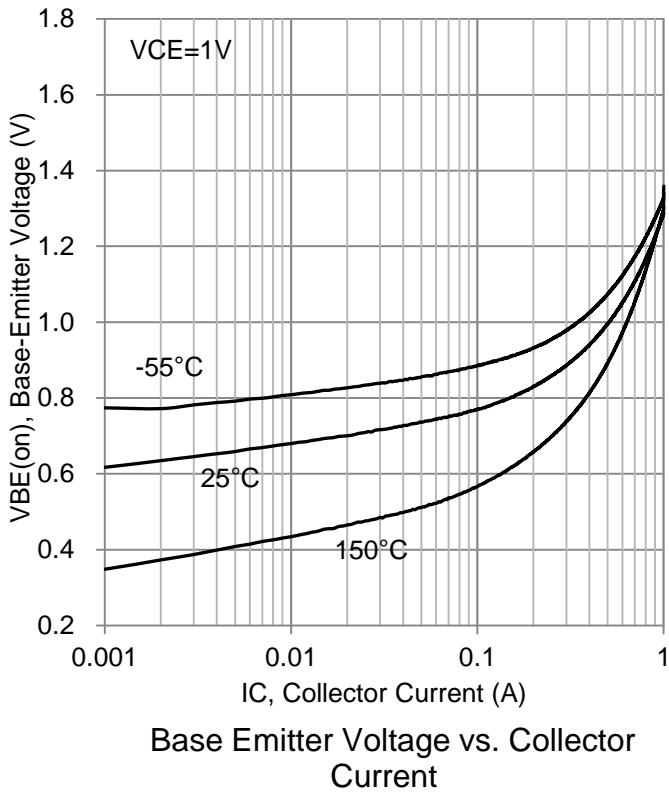
Delay Time	(VCC = 30 V, VEB=-0.5V, IC = 150mA, IB1 = 15 mA)	td	-	-	10	ns
Rise Time		tr	-	-	25	
Storage Time	(VCC = 30 V, IC = 150 mA, IB1 = IB2 = 15 mA)	ts	-	-	225	
Fall Time		tf	-	-	60	

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

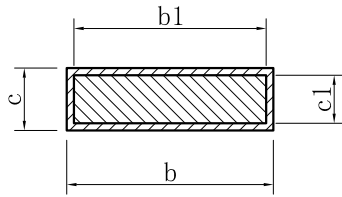
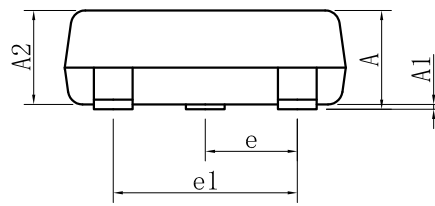
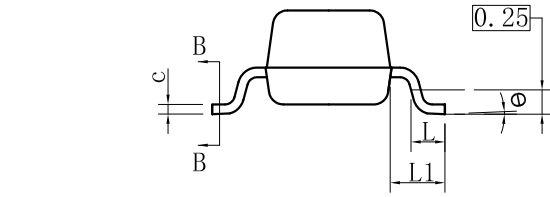
**6.ELECTRICAL CHARACTERISTICS CURVES**



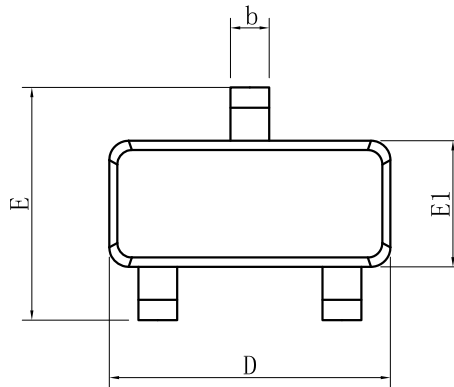
**6.ELECTRICAL CHARACTERISTICS CURVES(Con.)**



### 7. OUTLINE AND DIMENSIONS



SECTION B-B

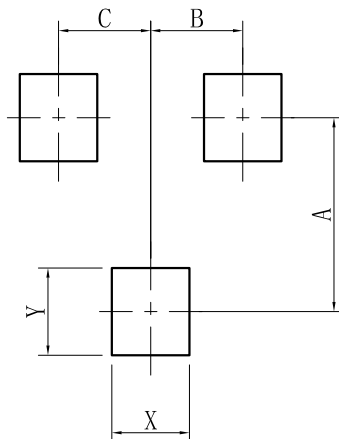


SOT23			
DIM	MIN	NOR	MAX
A	0.89	-	1.12
A1	0.01	-	0.10
A2	0.88	0.95	1.02
b	0.30	-	0.50
b1	0.30	0.40	0.45
c	0.08	-	0.20
c1	0.08	0.10	0.16
D	2.80	2.90	3.04
E	2.10	-	2.64
E1	1.20	1.30	1.40
e	0.95BSC		
e1	1.90BSC		
L	0.40	0.46	0.60
L1	0.54REF		
θ	0°	-	8°
All Dimensions in mm			

#### 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  $Ra0.4 \pm 0.2\mu m$

### 8. SOLDERING FOOTPRINT



SOT-23	
DIM	(mm)
X	0.80
Y	0.90
A	2.00
B	0.95
C	0.95

## **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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