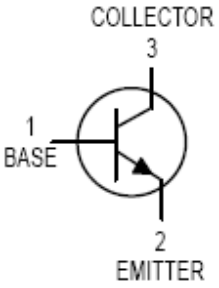
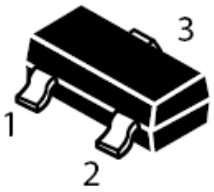
LITE-ON SEMICONDUCTORS

MMST4401

NPN General Purpose Transistor





FEATURES

- Ideal for Medium Power Amplification and Switching
- Complementary PNP Type available(MMST4403)

MECHANICAL DATA

- Case: SOT-323 Plastic
- Case material: “Green” molding compound, UL flammability classification 94V-0, (No Br. Sb. Cl)
- Lead Free in RoHS 2002/95/EC Compliant

Maximum Ratings @ T_A = 25℃

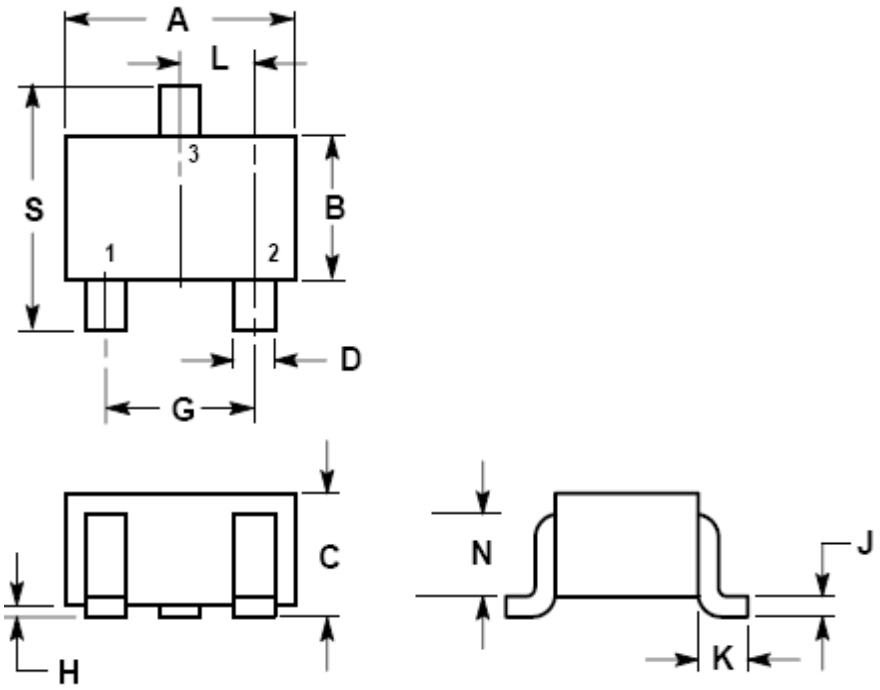
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	60	V
Collector-Emitter Voltage	V_{CEO}	40	V
Emitter-Base Voltage	V_{EBO}	6	V
Collector Current -Continuous	I_C	600	mA
Total Power Dissipation FR-4 board	P_D	150	mW
Junction Temperature	T_J	150	℃
Storage Temperature Range	T_{STG}	-55~+150	℃

Electrical Characteristics @ T_A = 25℃ unless otherwise specified

Characteristic	Test Condition	Symbol	Min.	Typ.	Max.	Unit
Collector-base breakdown voltage	I_C=100μA,I_E=0	V_{CBO}	60			V
Collector-emitter breakdown voltage	I_C=1mA,I_B=0	V_{CEO}	40			V
Emitter-base breakdown voltage	I_E=100μA,I_C=0	V_{EBO}	6			V
Collector-emitter cut-off current	V_{CE}=35V,$V_{BE(off)}$=0.4V	I_{CEX}			0.1	uA
DC current gain	V_{CE}=1V,I_C=0.1mA	h_{FE1}	20			
	V_{CE}=1V,I_C=1mA	h_{FE2}	40			
	V_{CE}=1V,I_C=10mA	h_{FE3}	80			
	V_{CE}=1V,I_C=150mA	h_{FE4}	100		300	
	V_{CE}=2V,I_C=500mA	h_{FE5}	40			
Collector-emitter saturation voltage	I_C=150mA,I_B=15mA	V_{CE}(sat)1			0.4	V
	I_C=500mA,I_B=50mA	V_{CE}(sat)2			0.75	V
Base-emitter saturation voltage	I_C=150mA,I_B=15mA	V_{BE}(sat)1	0.75		0.95	V
	I_C=500mA,I_B=50mA	V_{BE}(sat)2			1.20	V
Transition frequency	V_{CE}=10V,I_C=20mA, f=100MHz	f_T	250			MHz
Output Capacitance	V_{CB}=5V,I_E=0,f=1MHz	Cob			6.5	pF
Delay time	V_{CC}=30V, $V_{BE(off)}$=2V I_C=150mA , I_{B1}= 15mA	T_d			15	nS
Rise time		T_r			20	nS
Storage time	V_{CC}=30 V, I_C=150mA I_{B1}=-I_{B2}=15mA	T_s			225	nS
Fall time		T_f			30	nS

REV.0, Jan-2013, KSNR22

SOT-323 Outline Dimension



Symbol	Dimension In Millimeters	
	Min	Max.
A	1.80	2.20
B	1.15	1.35
C	0.80	1.00
D	0.30	0.40
G	1.20	1.40
H	0.00	0.10
J	0.10	0.25
K	0.425 REF	
L	0.650 BSC	
N	0.700 REF	
S	2.00	2.40

Device Marking:

Device P/N	Marking code
MMST4401	2X

Electrical characteristic curves

Fig.1 Turn–On Time

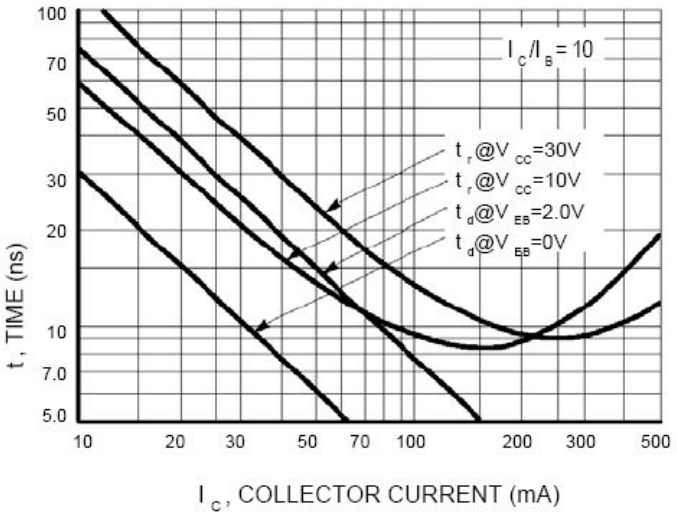


Fig.2 Rise Time & Fall Time

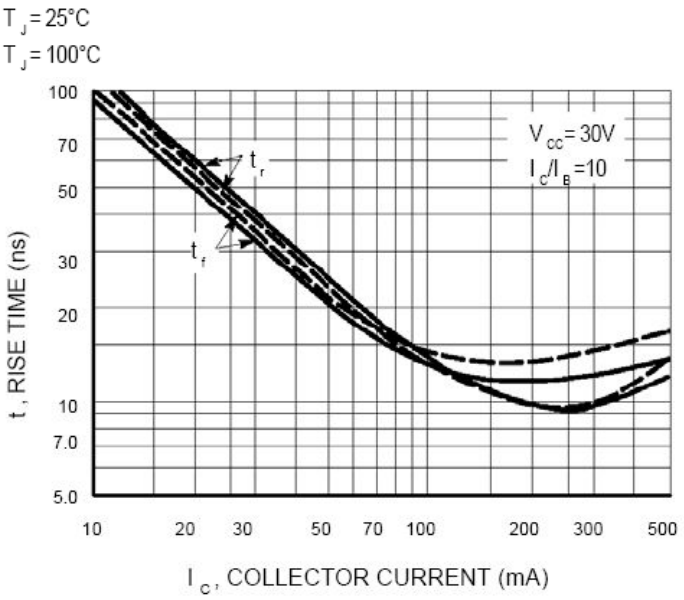


Fig.3 Storage Time

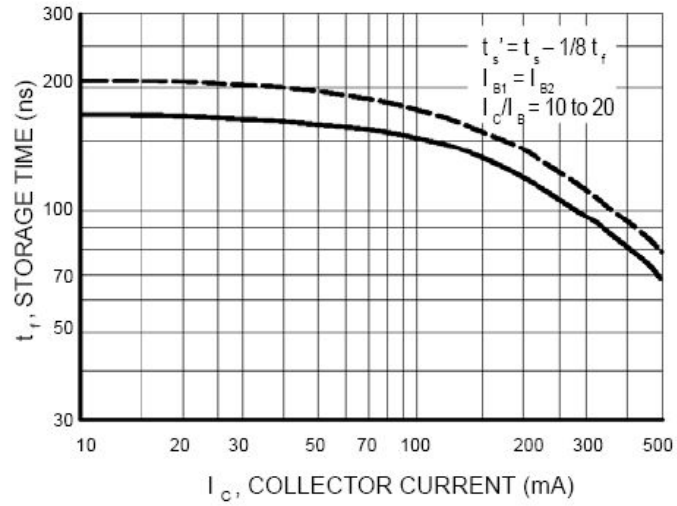


Fig.4 Fall Time

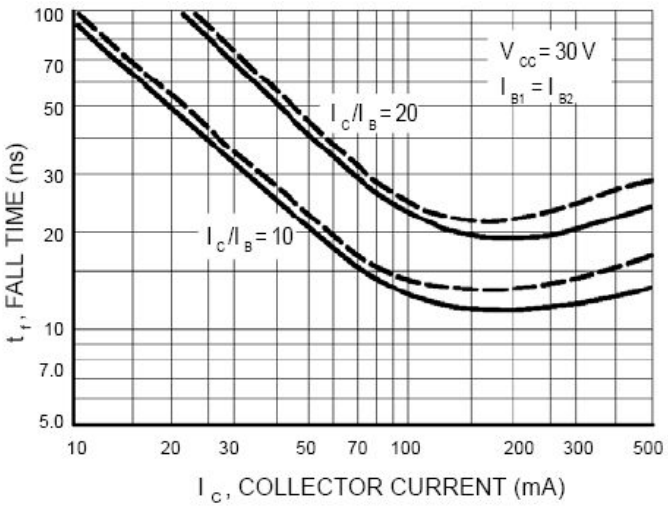
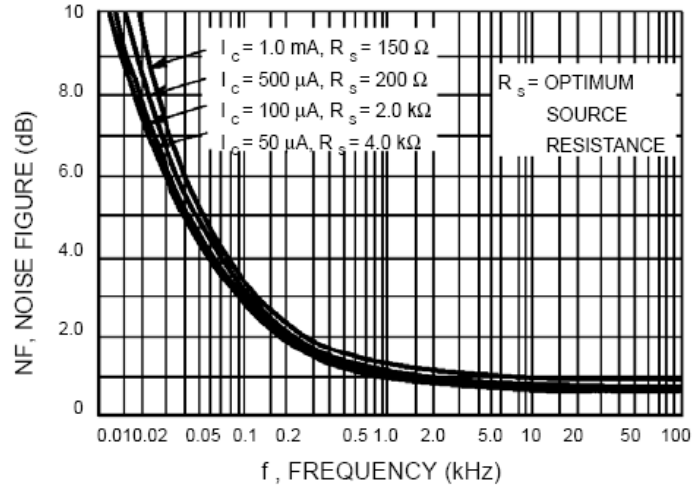
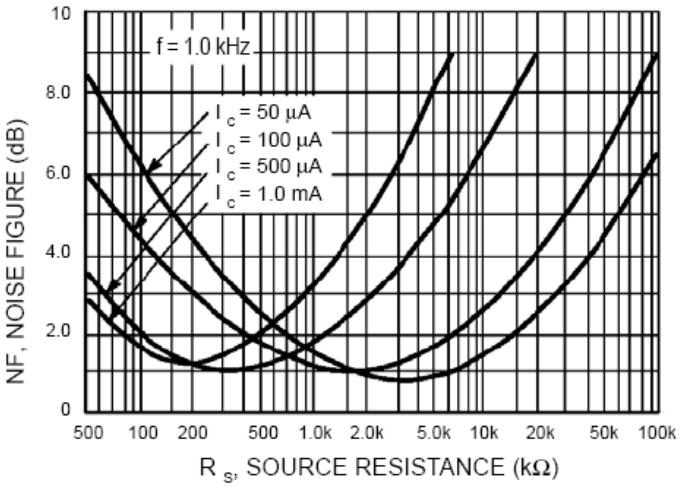


Fig.5 Frequency Effects

Fig.6 Source Resistance Effects

V_{CE} = 10 Vdc, T_A = 25°C
Bandwidth = 1.0 Hz



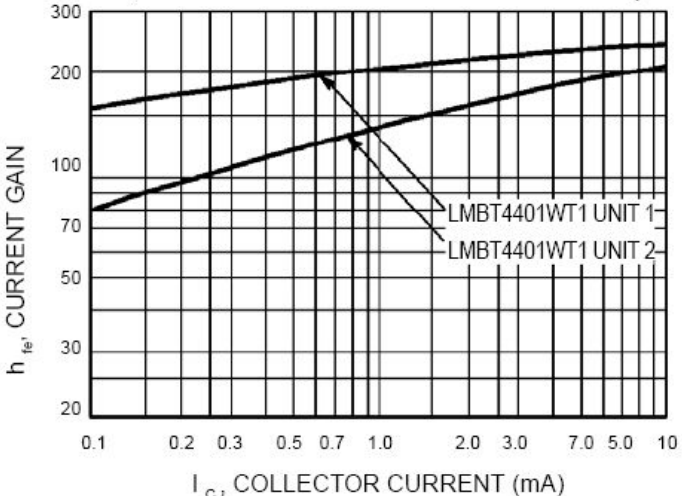


Electrical characteristic curves

Fig.7 Current Gain **Fig.8 Input Admittance**

(V_{CE} = 10 Vdc, f = 1.0 kHz, T_A = 25°C)

This group of graphs illustrates the relationship between h fe and other “h” parameters for this series of ransistors. To obtain these curves, a high–gain and a low–gain unit were selected from the LMBT4401WT1G lines, and the same units were used to develop the correspondingly numbered curves on each graph.



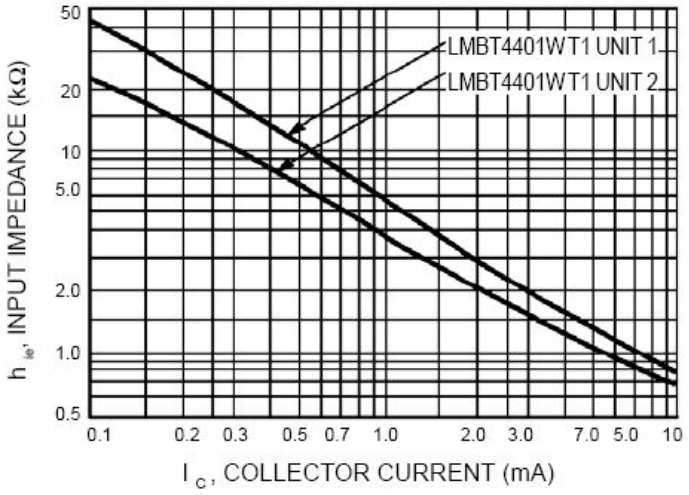
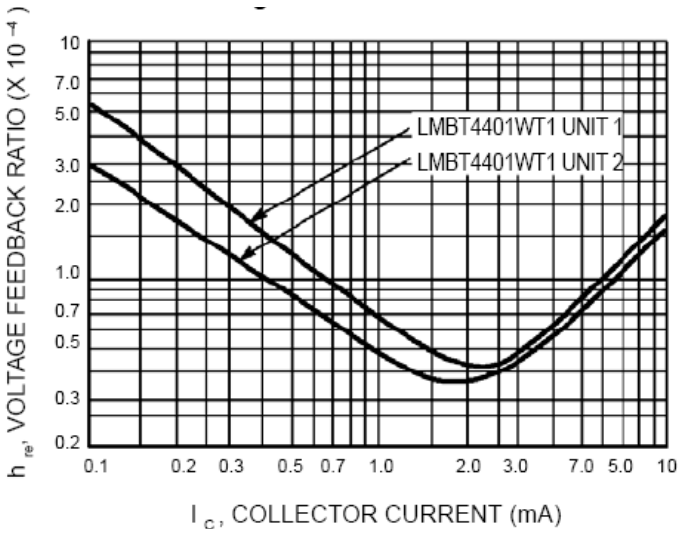


Fig.9 Voltage Feedback Ratio **Fig.10 Output Impedance**



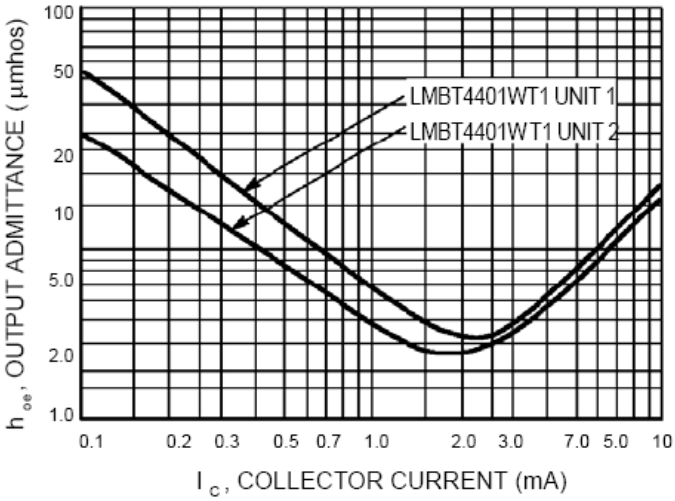
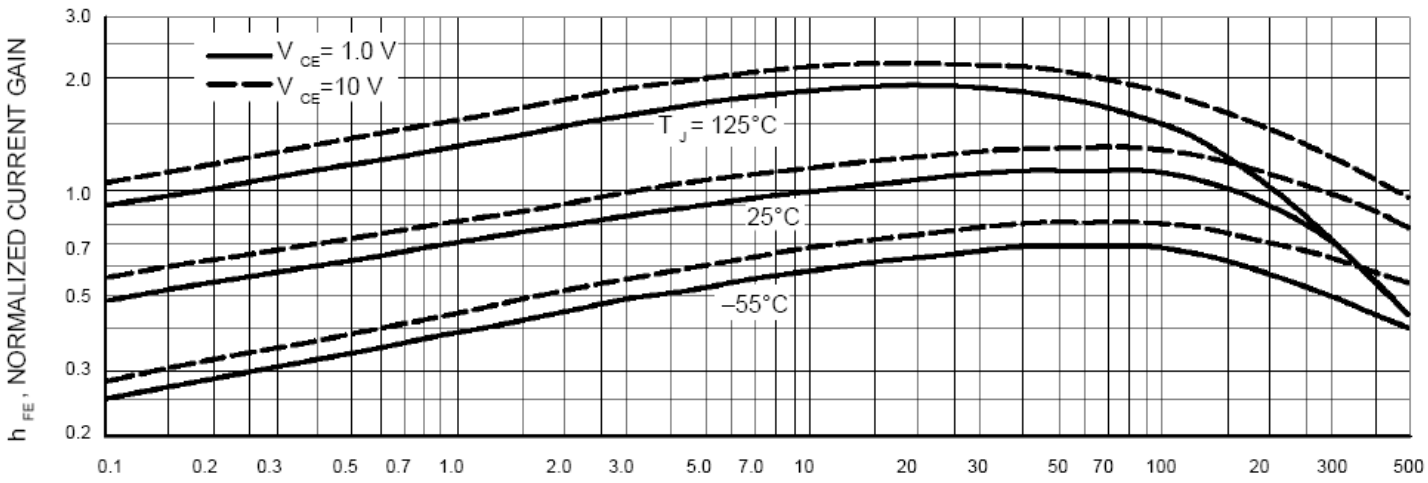


Fig.11 DC Current Gain



Electrical characteristic curves

Fig.12 Collector Saturation Region

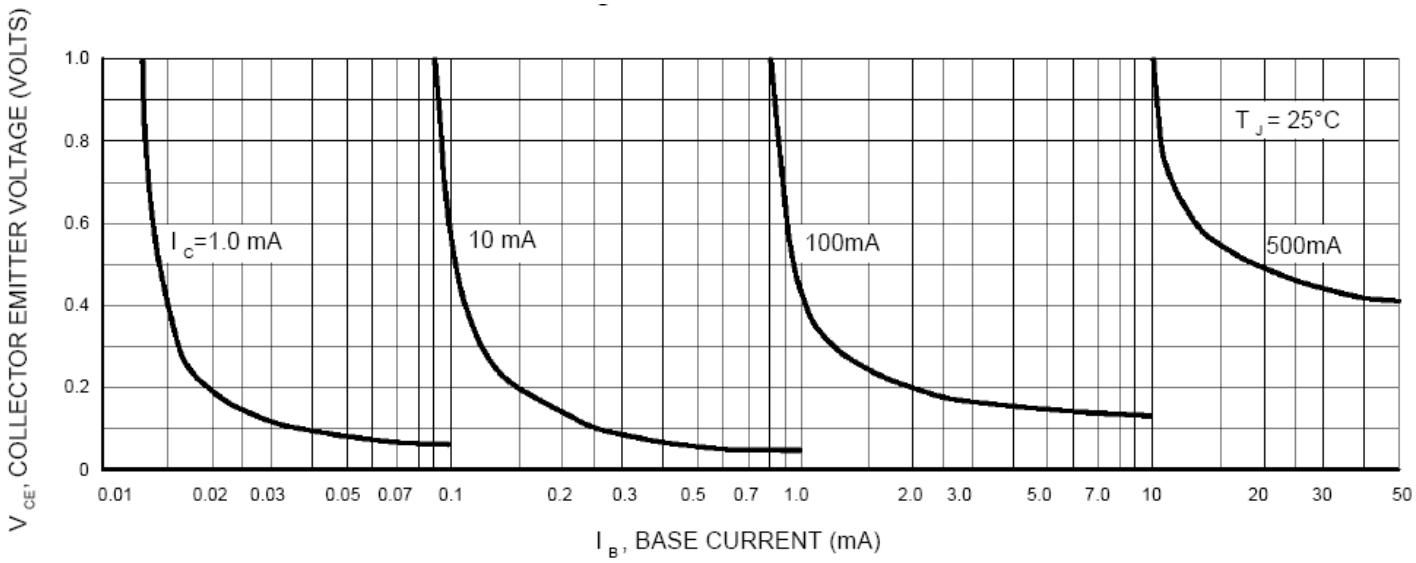


Fig.13 ON Voltage

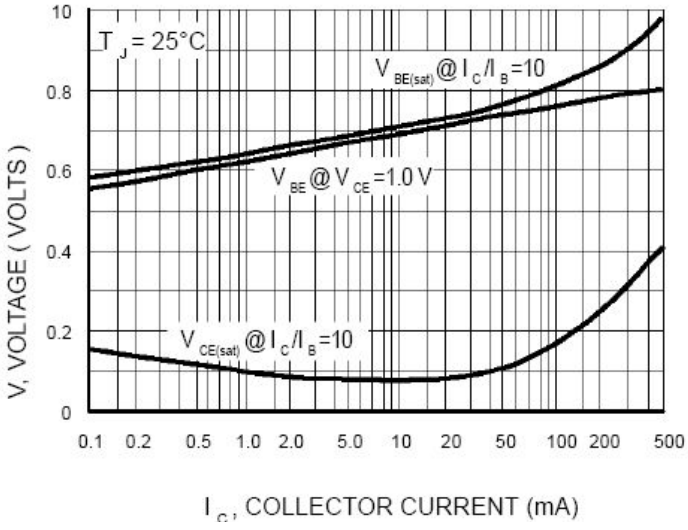


Fig.14 Temperature Coefficients

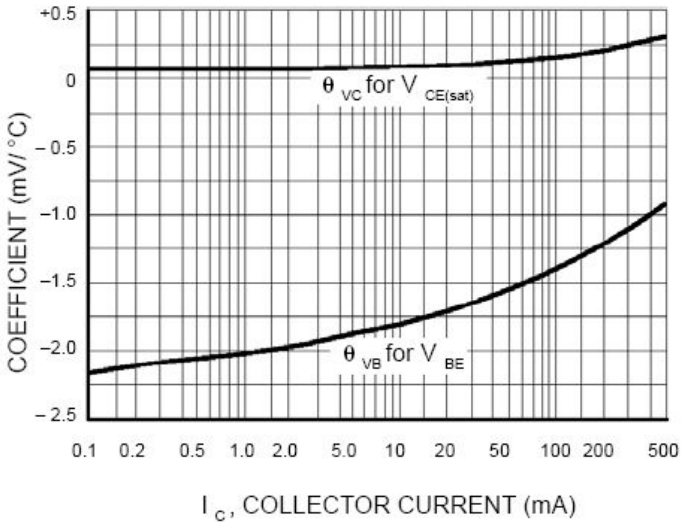


Fig.15 Capacitance

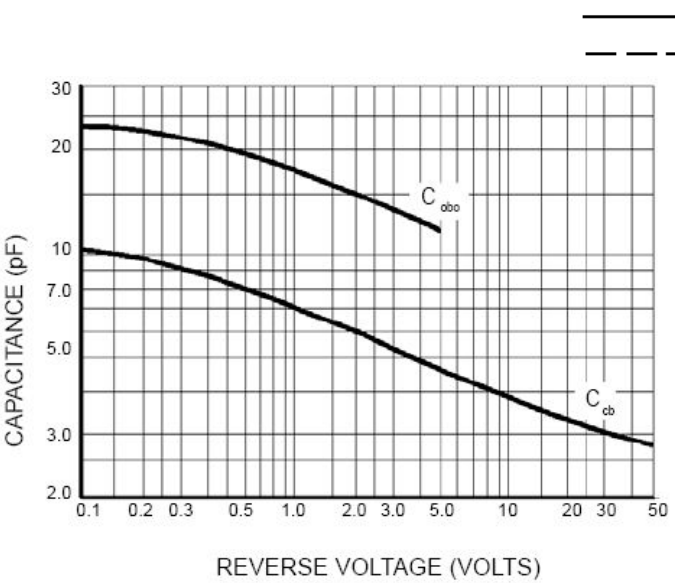
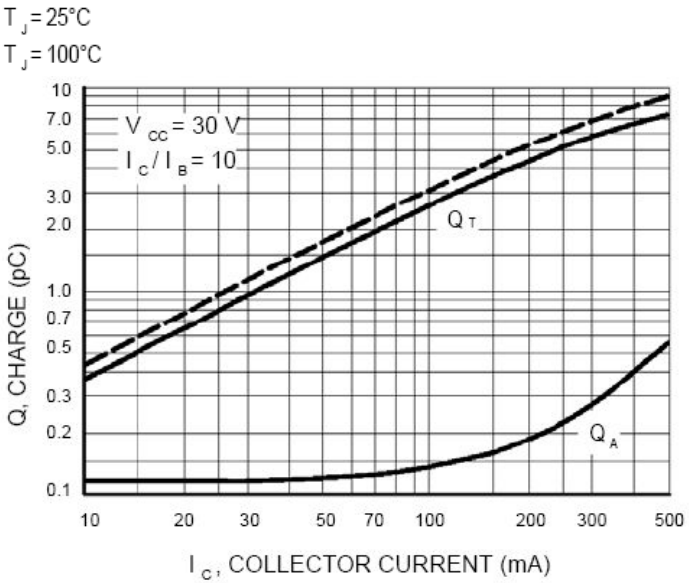


Fig.16 Charge Data



Important Notice and Disclaimer

LSC reserves the right to make changes to this document and its products and specifications at any time without notice. Customers should obtain and confirm the latest product information and specifications before final design, purchase or use.

LSC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does LSC assume any liability for application assistance or customer product design. LSC does not warrant or accept any liability with products which are purchased or used for any unintended or unauthorized application.

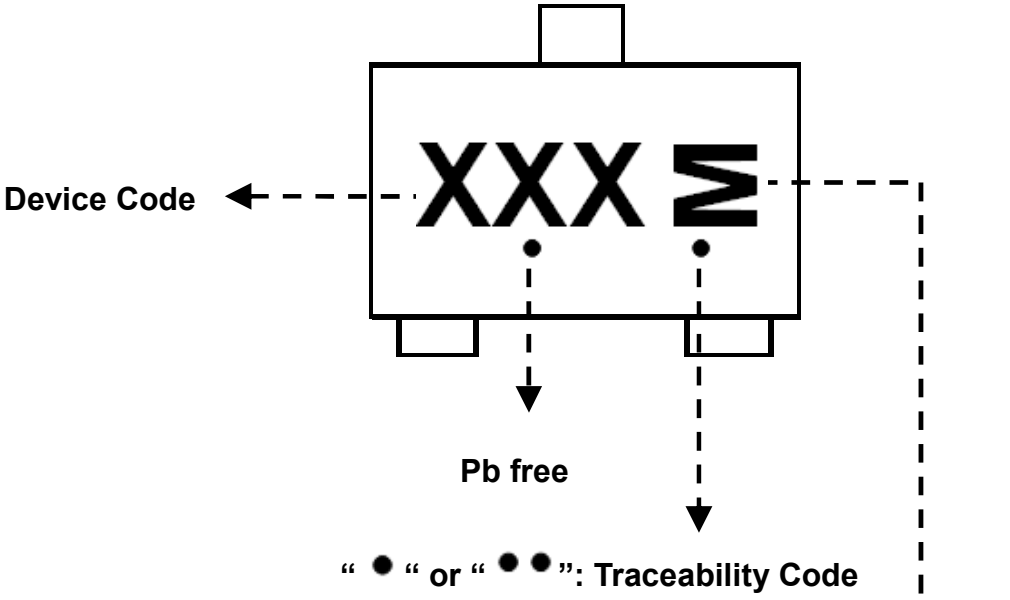
No license is granted by implication or otherwise under any intellectual property rights of LSC.

LSC products are not authorized for use as critical components in life support devices or systems without express written approval of LSC.

New Marking Rule Notification

Range: In order to have well management in process control, the new marking rule is applied to small signal device including Switching Diode, Transistor and Schottky Diode.

Package: SOT-23 / SOT-323 / SOT-523



Odd Year	Even Year
1	E
2	F
3	H
4	J
5	K
6	L
7	N
8	P
9	U
T	X
V	Y
C	Z