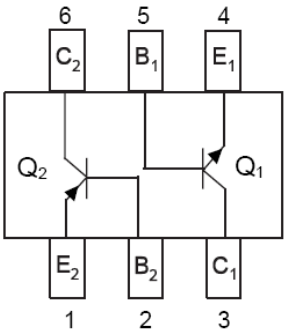
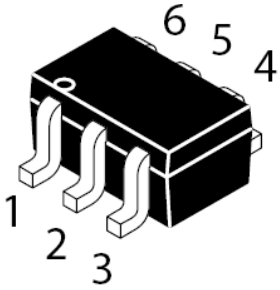
LITE-ON SEMICONDUCTORS

MMDT5541

NPN/PNP Multi-Chip Transistor





FEATURES

- Ideal for Medium Power Amplification and Switching

MECHANICAL DATA

- Case: SOT-363 Plastic
- Case material: “Green” molding compound, UL flammability classification 94V-0, (No Br. Sb. Cl)
- Lead Free in RoHS 2002/95/EC Compliant

NPN - Maximum Ratings @ T_A = 25℃

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	160	V
Collector-Emitter Voltage	V_{CEO}	140	V
Emitter-Base Voltage	V_{EBO}	6	V
Collector Current -Continuous	I_C	600	mA

PNP - Maximum Ratings @ T_A = 25℃

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	-160	V
Collector-Emitter Voltage	V_{CEO}	-150	V
Emitter-Base Voltage	V_{EBO}	-5	V
Collector Current -Continuous	I_C	-50	mA

Thermal Characteristic

Characteristic	Symbol	Value	Unit
Total Power Dissipation FR-5 board	P_D	225	mW
Junction Temperature	T_J	150	℃
Storage Temperature Range	T_{STG}	-55~+150	℃

REV. 0, Jan-2013, KSTR10

Q1 - 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}	180			V
Collector-emitter breakdown voltage	I_C=1mA,I_B=0	V_{CEO}	160			V
Emitter-base breakdown voltage	I_E=10μA,I_C=0	V_{EBO}	6			V
Collector-base cut-off current	V_{CB}=120V,I_E=0	I_{CBO}			0.05	uA
Emitter-base cut-off current	V_{EB}=4V,I_C=0	I_{EBO}			0.05	uA
DC current gain	V_{CE}=5V,I_C=1mA	h_{FE1}	80			
	V_{CE}=5V,I_C=10mA	h_{FE2}	80		250	
	V_{CE}=5V,I_C=50mA	h_{FE3}	30			
Collector-emitter saturation voltage	I_C=10mA,I_B=1mA	V_{CE}(sat)1			0.15	V
	I_C=50mA,I_B=5mA	V_{CE}(sat)2			0.2	V
Base-emitter saturation voltage	I_C=10mA,I_B=1mA	V_{BE}(sat)1			1	V
	I_C=50mA,I_B=5mA	V_{BE}(sat)2			1	V

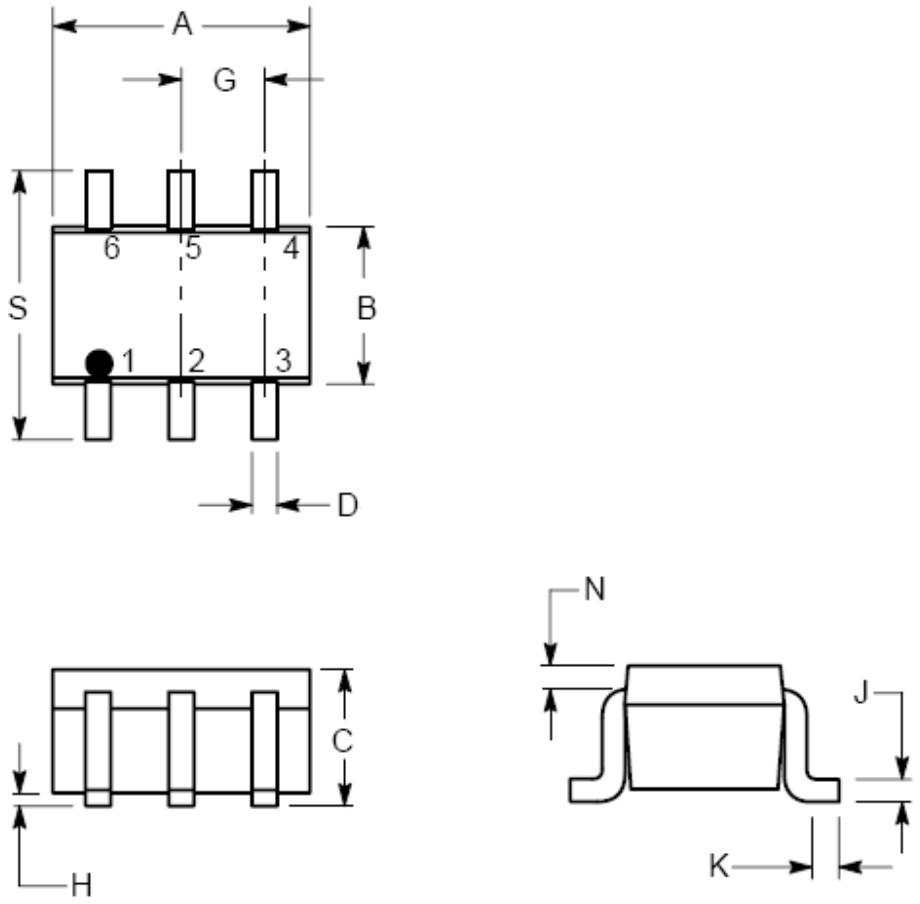
Q2 - Electrical Characteristics @ T_A = 25℃ unless otherwise specified

Characteristic	Test Condition	Symbol	Min.	Typ.	Max.	Unit
Collector-base breakdown voltage	I_C=-100μA,I_E=0	V_{CBO}	-160			V
Collector-emitter breakdown voltage	I_C=-1mA,I_B=0	V_{CEO}	-150			V
Emitter-base breakdown voltage	I_E=-10μA,I_C=0	V_{EBO}	-5			V
Collector-base cut-off current	V_{CB}=-120V,I_E=0	I_{CBO}			-0.05	uA
DC current gain	V_{CE}=-5V,I_C=-1mA	h_{FE1}	50			
	V_{CE}=-5V,I_C=-10mA	h_{FE2}	60		240	
	V_{CE}=-5V,I_C=-50mA	h_{FE3}	50			
Collector-emitter saturation voltage	I_C=-10mA,I_B=-1mA	V_{CE}(sat)1			-0.2	V
	I_C=-50mA,I_B=-5mA	V_{CE}(sat)2			-0.5	V
Base-emitter saturation voltage	I_C=-10mA,I_B=-1mA	V_{BE}(sat)1			-1	V
	I_C=-50mA,I_B=-5mA	V_{BE}(sat)2			-1	V

Small Signal Characteristics

Characteristic	Test Condition	Symbol	Min.	Typ.	Max.	Unit
Transition frequency	V_{CE}=-10V,I_C=-10mA, f=100MHz	f_T	100		300	MHz
Collector output capacitance	V_{CB}=-10V,I_E=0,f=1MHz	Cob			6	pF
Noise Figure	V_{CE}=-5V, I_C=-0.2mA, R_S=10KΩ,f =1kHz	NF			8	dB

SOT-363 Outline Dimension



Symbol	Dimension In Millimeters	
	Min	Max.
A	1.89	2.20
B	1.15	1.35
C	0.80	1.10
D	0.10	0.30
G	0.65 BSC	
H	---	0.10
J	0.10	0.25
K	0.10	0.30
N	0.20 REF	
S	2.00	2.20

Device Marking:

Device P/N	Marking code
MMDT5541	G1

Electrical characteristic curves

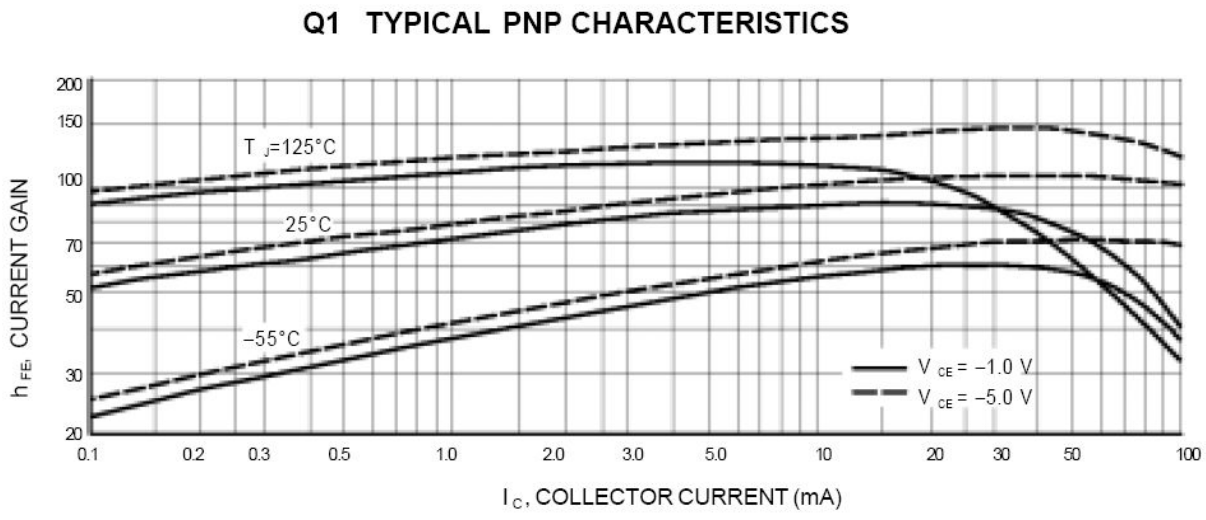


Figure 1. DC Current Gain

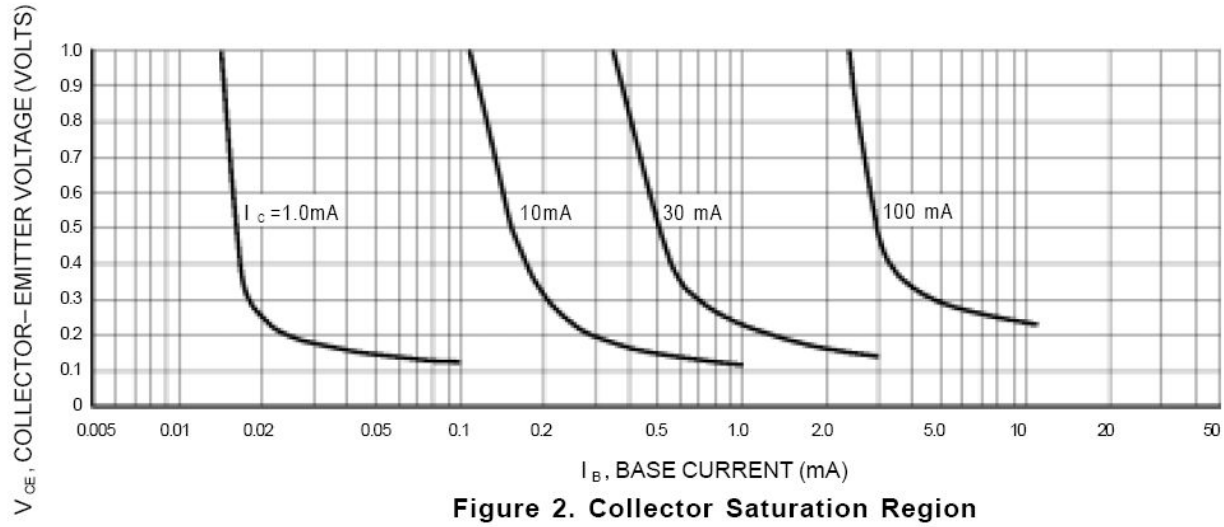


Figure 2. Collector Saturation Region

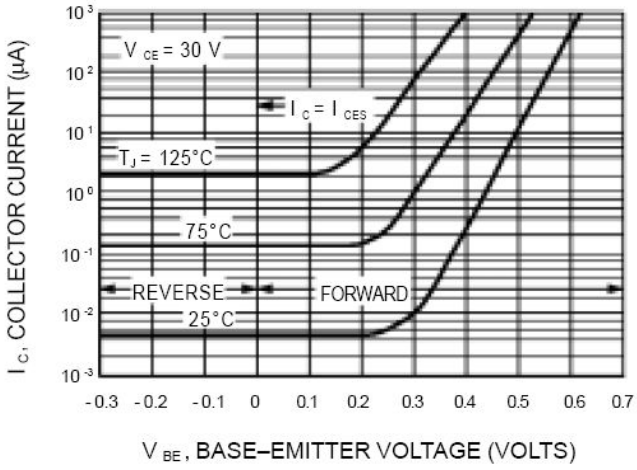


Figure 3. Collector Cut−Off Region

Electrical characteristic curves

Q1 TYPICAL PNP CHARACTERISTICS

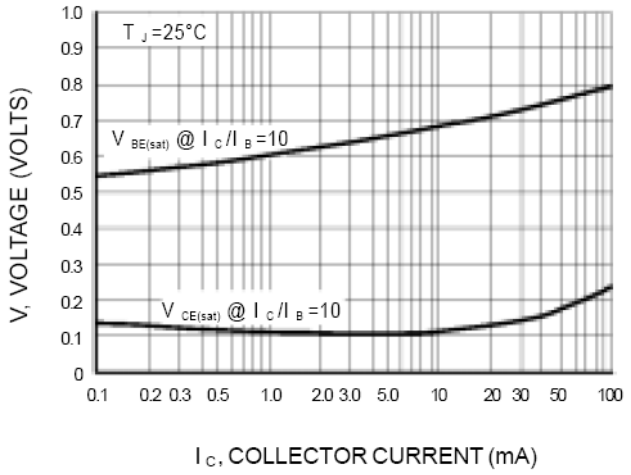


Figure 4. "On" Voltages

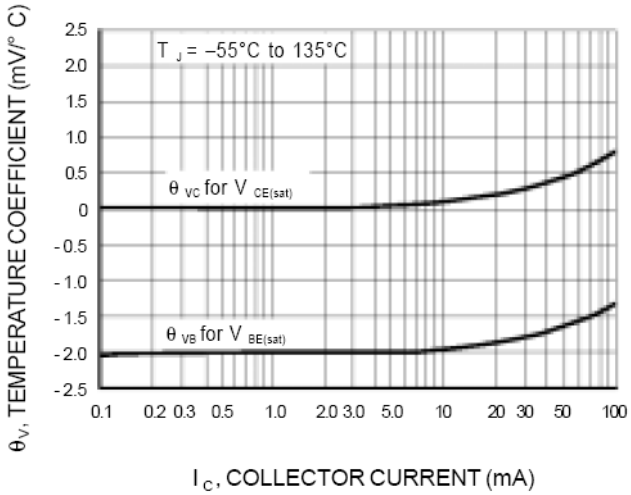


Figure 5. Temperature Coefficients

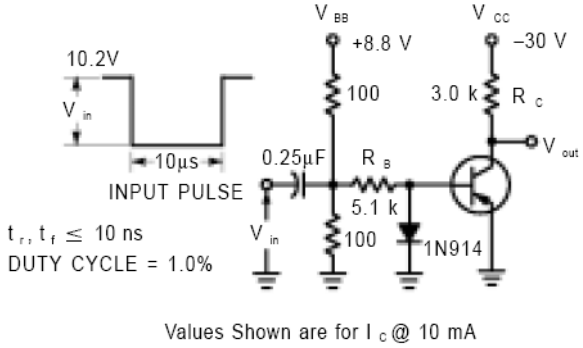


Figure 6. Switching Time Test Circuit

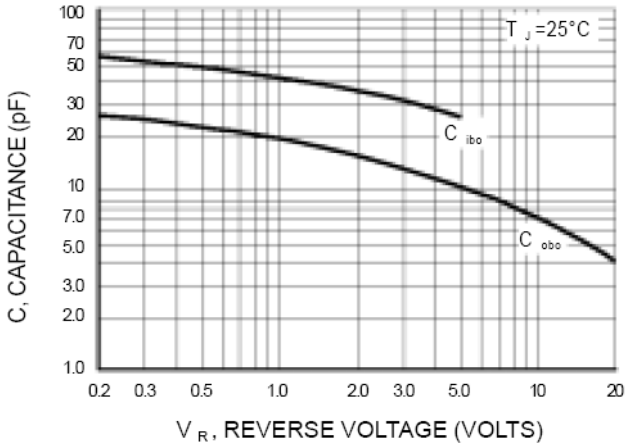


Figure 7. Capacitances

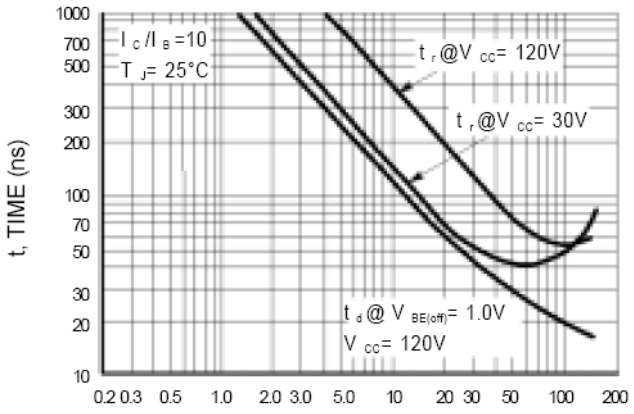


Figure 8. Turn–On Time

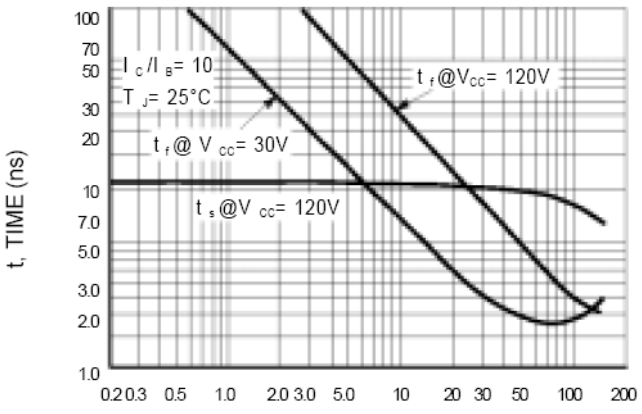


Figure 9. Turn–Off Time

Electrical characteristic curves

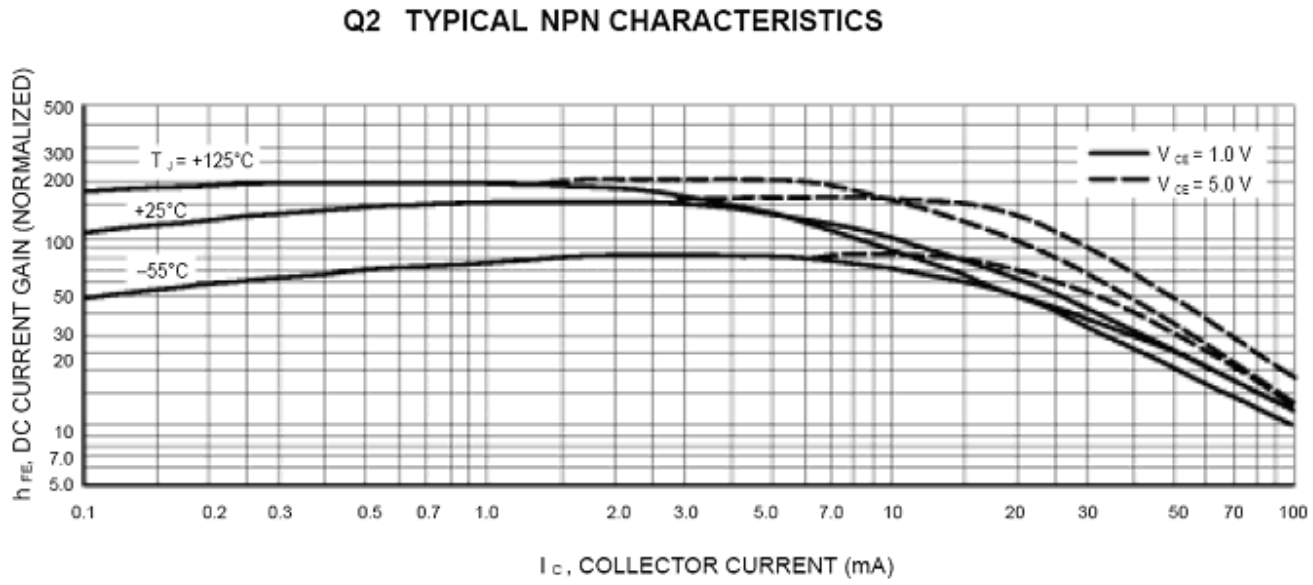


Figure 10. DC Current Gain

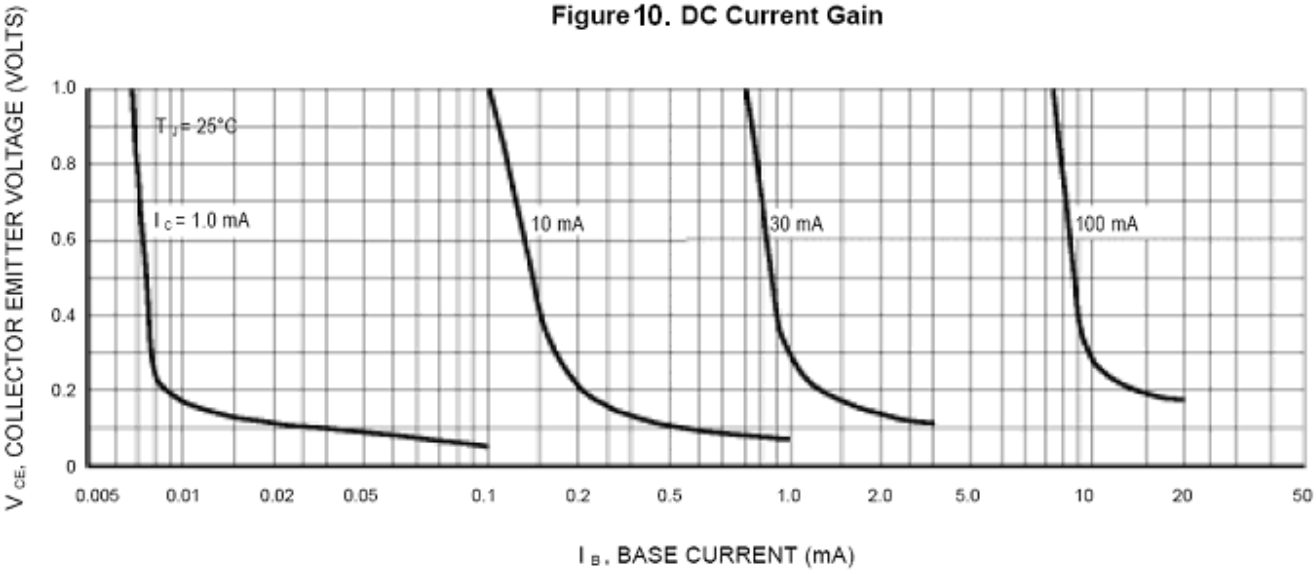


Figure 11. Collector Saturation Region

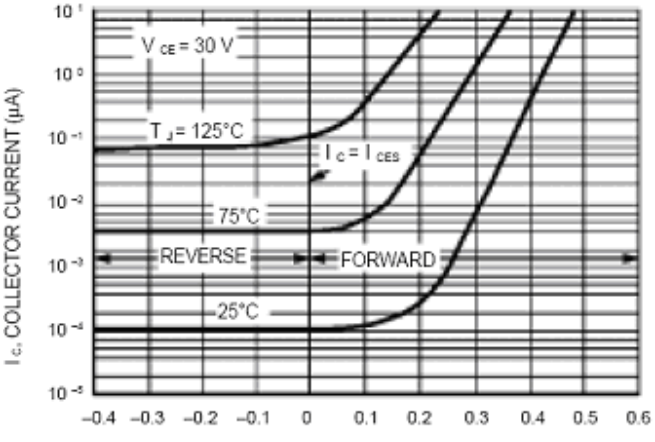


Figure 12. Collector Cut−Off Region

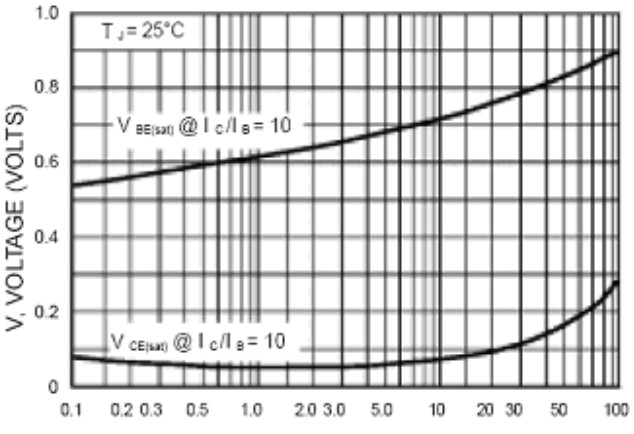


Figure 13. "On" Voltages

Electrical characteristic curves

Q2 TYPICAL NPN CHARACTERISTICS

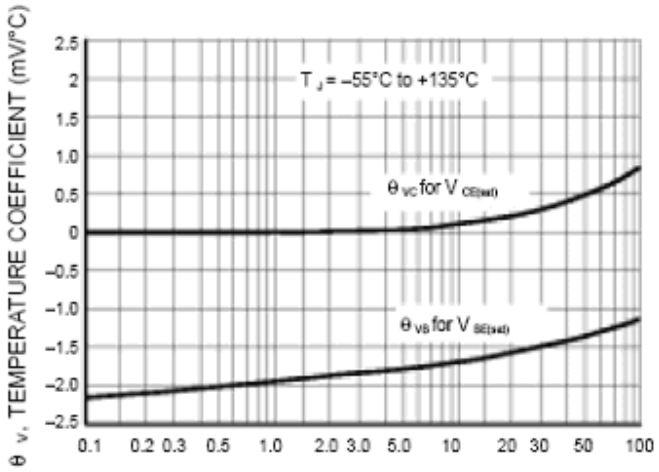


Figure 14. Temperature Coefficients

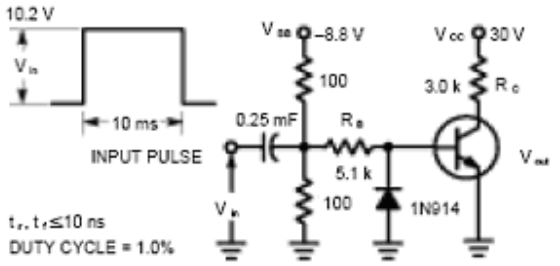


Figure 15. Switching Time Test Circuit

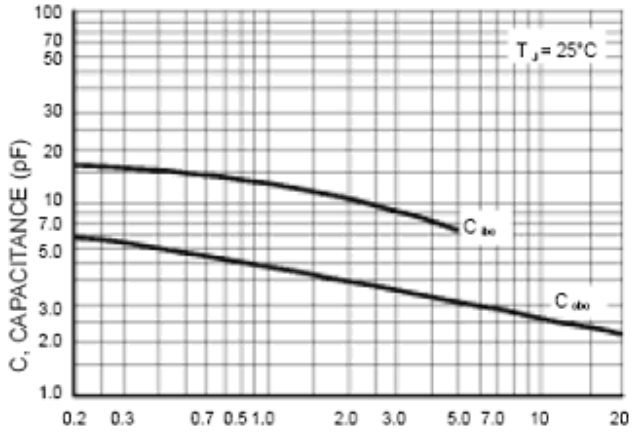


Figure 16. Capacitances Figure

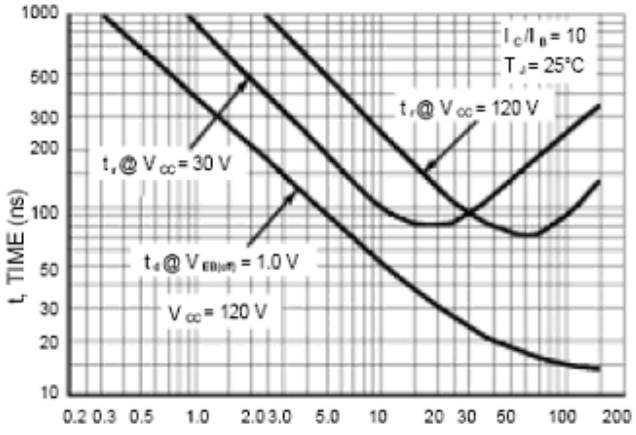


Figure 17. Turn–On Time

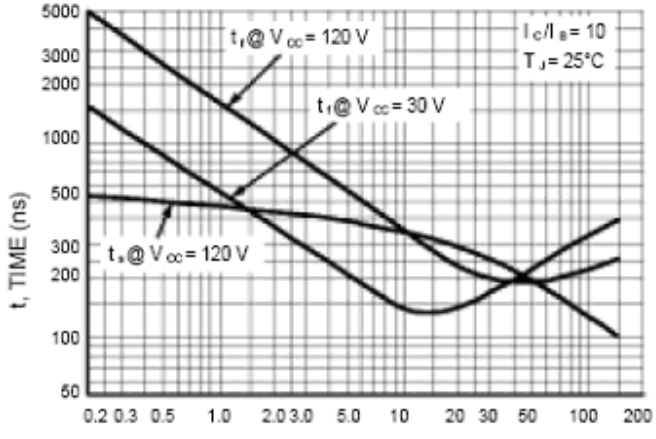


Figure 18. Turn–Off Time

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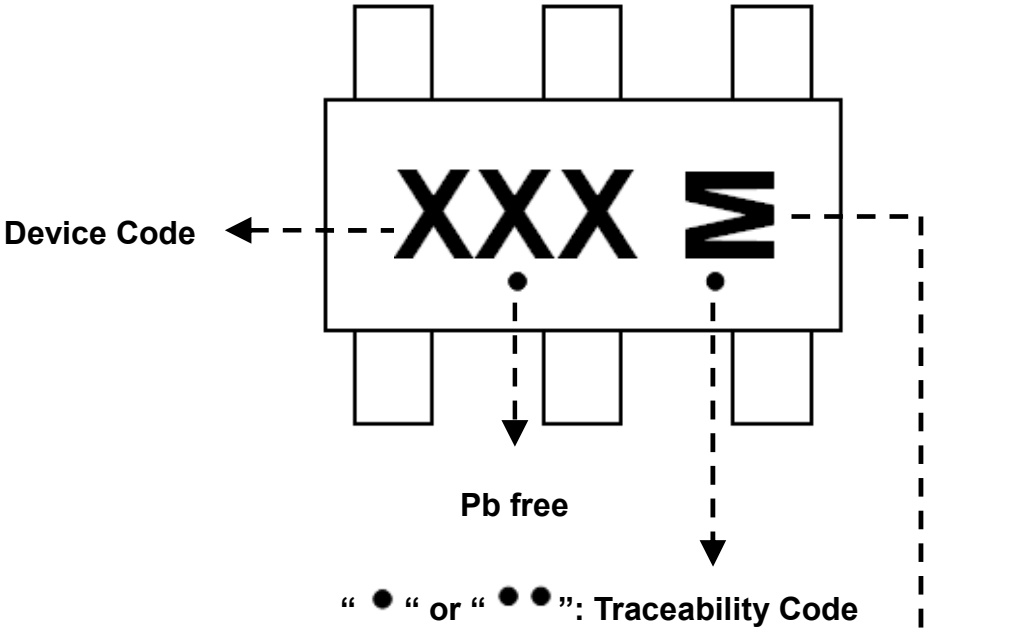
New Marking Rule Notification

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-363



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