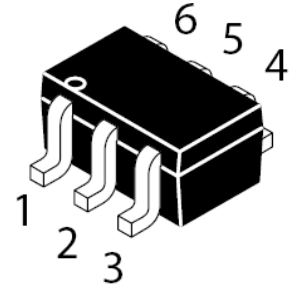
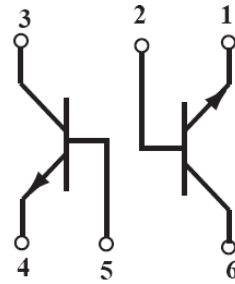


NPN/NPN Multi-Chip Transistor
FEATURES

- Ideal for low 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

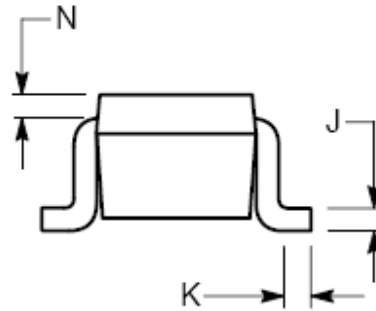
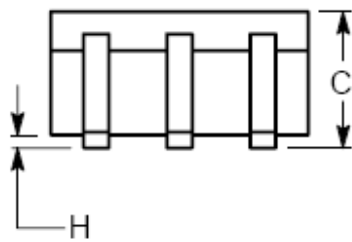
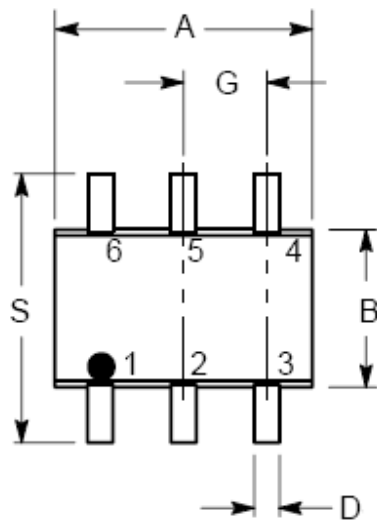

Maximum Ratings @ $T_A = 25^\circ\text{C}$

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	60	V
Collector-Emitter Voltage	V_{CEO}	40	V
Emitter-Base Voltage	V_{EBO}	5	V
Collector Current -Continuous	I_C	200	mA
Collector Power Dissipation	P_C	200	mW
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55~+150	$^\circ\text{C}$

Electrical Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Test Condition	Symbol	Min.	Typ.	Max.	Unit
Collector-base breakdown voltage	$I_C=10\mu\text{A}, I_E=0$	V_{CBO}	60			V
Collector-emitter breakdown voltage	$I_C=1\text{mA}, I_B=0$	V_{CEO}	40			V
Emitter-base breakdown voltage	$I_E=10\mu\text{A}, I_C=0$	V_{EBO}	5			V
Collector-base cut-off current	$V_{CB}=30\text{V}, I_E=0$	I_{CBO}			0.05	μA
Emitter-base cut-off current	$V_{EB}=5\text{V}, I_C=0$	I_{EBO}			0.05	μA
DC current gain	$V_{CE}=1\text{V}, I_C=0.1\text{mA}$	h_{FE1}	40			
	$V_{CE}=1\text{V}, I_C=1\text{mA}$	h_{FE2}	70			
	$V_{CE}=1\text{V}, I_C=10\text{mA}$	h_{FE3}	100		300	
	$V_{CE}=1\text{V}, I_C=50\text{mA}$	h_{FE4}	60			
	$V_{CE}=1\text{V}, I_C=100\text{mA}$	h_{FE5}	30			
Collector-emitter saturation voltage	$I_C=10\text{mA}, I_B=1\text{mA}$	$V_{CE(sat)1}$			0.2	V
	$I_C=50\text{mA}, I_B=5\text{mA}$	$V_{CE(sat)2}$			0.3	V
Base-emitter saturation voltage	$I_C=10\text{mA}, I_B=1\text{mA}$	$V_{BE(sat)1}$	0.65		0.85	V
	$I_C=50\text{mA}, I_B=5\text{mA}$	$V_{BE(sat)2}$			0.95	V
Transition frequency	$V_{CE}=20\text{V}, I_C=10\text{mA}, f=100\text{MHz}$	f_T	300			MHz
Collector output capacitance	$V_{CB}=5\text{V}, I_E=0, f=1\text{MHz}$	C_{ob}			4	pF
Noise figure	$V_{CE}=5\text{V}, I_C=0.1\text{mA}, f=1\text{kHz}, R_S=1\text{K}\Omega$	NF			5	dB
Delay time	$V_{CC}=3\text{V}, V_{BE}=-0.5\text{V}$	T_d			35	nS
Rise time	$I_C=10\text{mA}, I_{B1}=-I_{B2}=1\text{mA}$	T_r			35	nS
Storage time	$V_{CC}=3\text{V}, I_C=10\text{mA}$	T_s			200	nS
Fall time	$I_{B1}=-I_{B2}=1\text{mA}$	T_f			50	nS

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
MMDT3904	MA

Figure 1. Capacitance

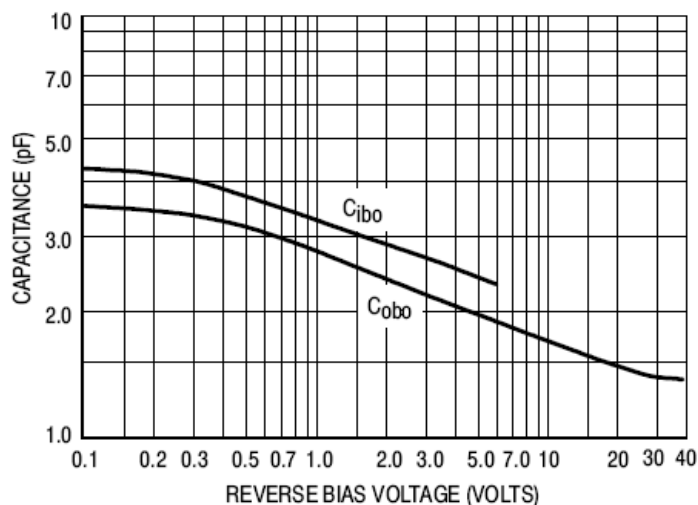


Figure 2. Charge Data

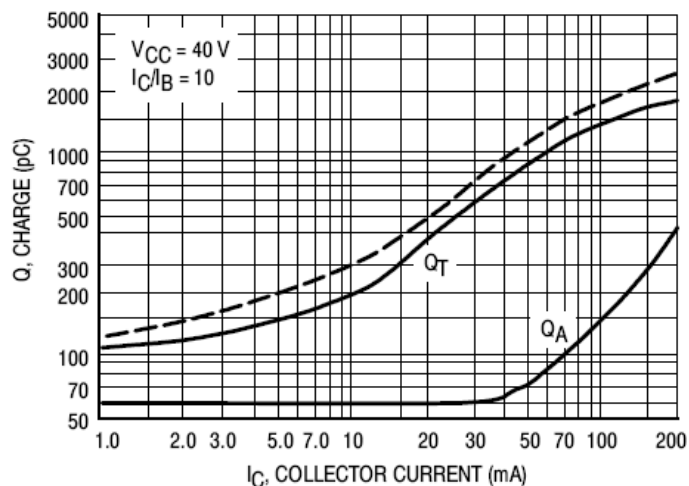


Figure 3. Turn-On Time

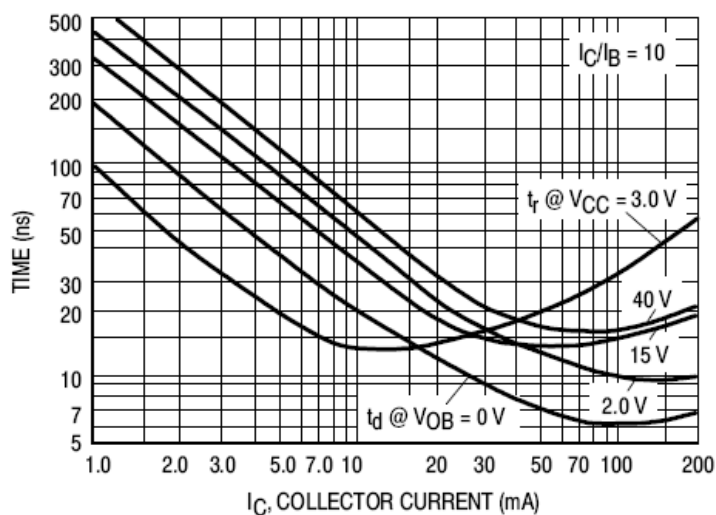


Figure 4. Rise Time

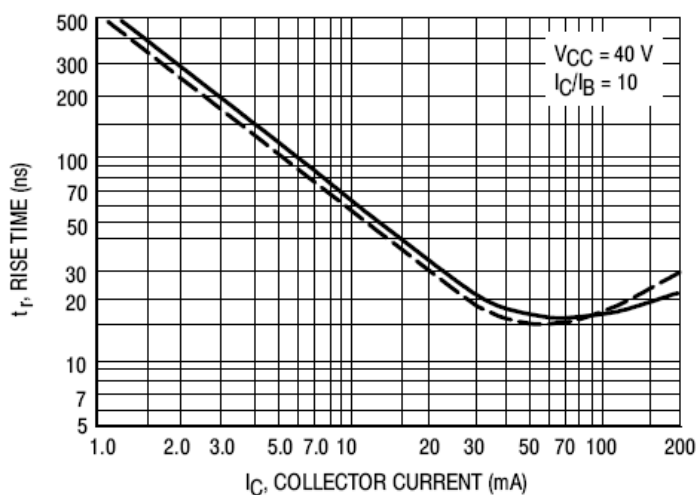


Figure 5. Storage Time

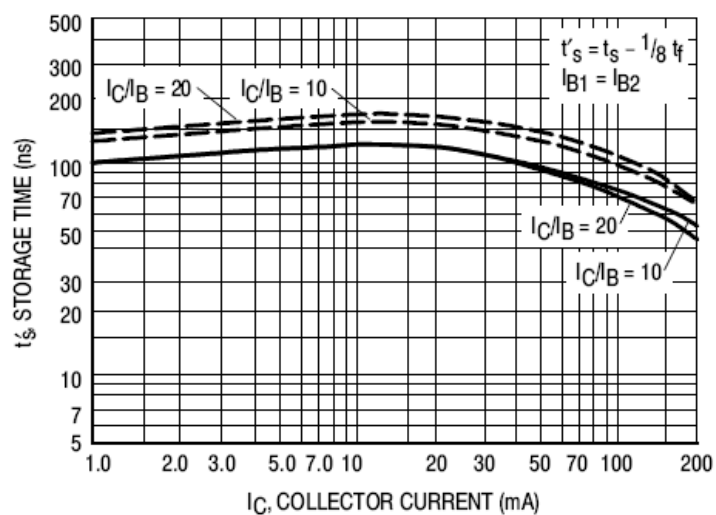


Figure 6. Fall Time

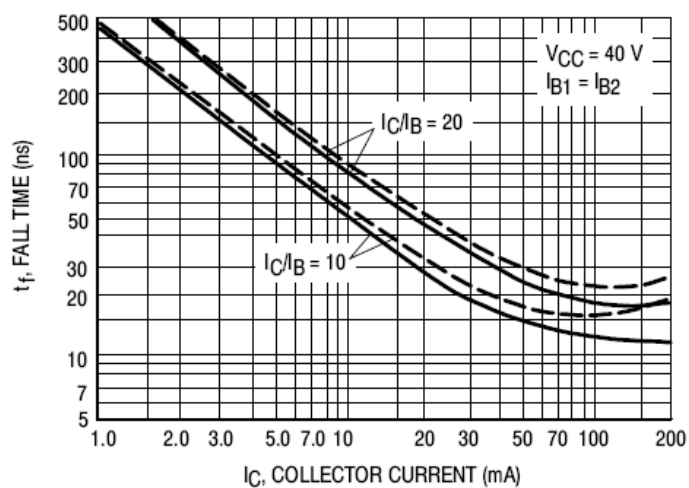


Figure 7. Noise Figure

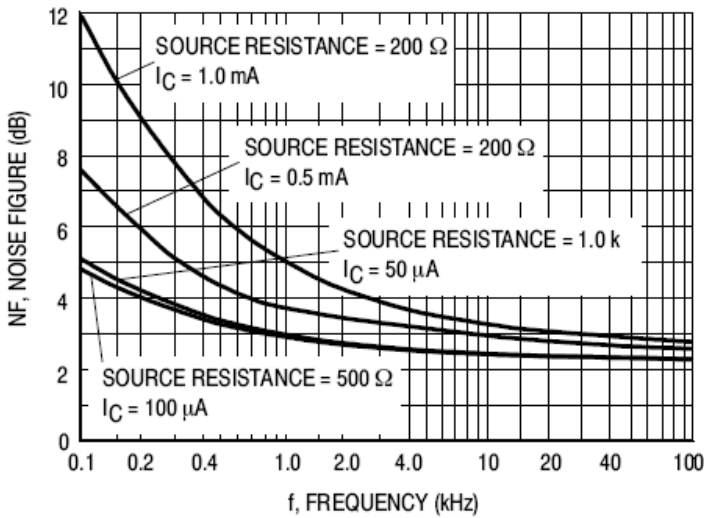


Figure 8. Noise Figure

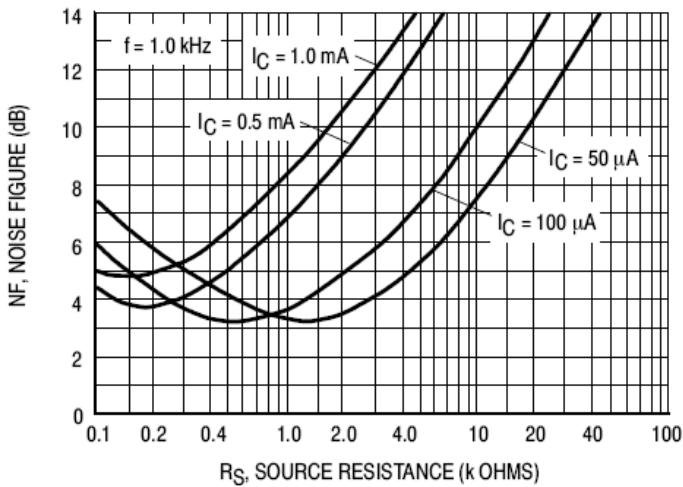


Figure 9. Current Gain

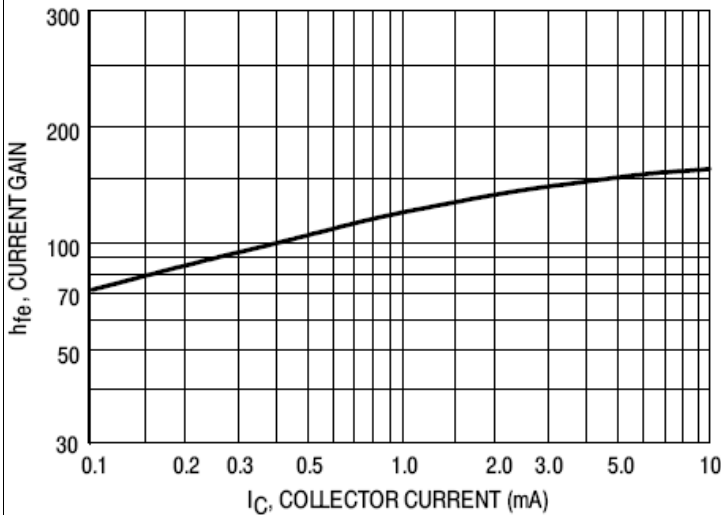


Figure 10. Output Admittance

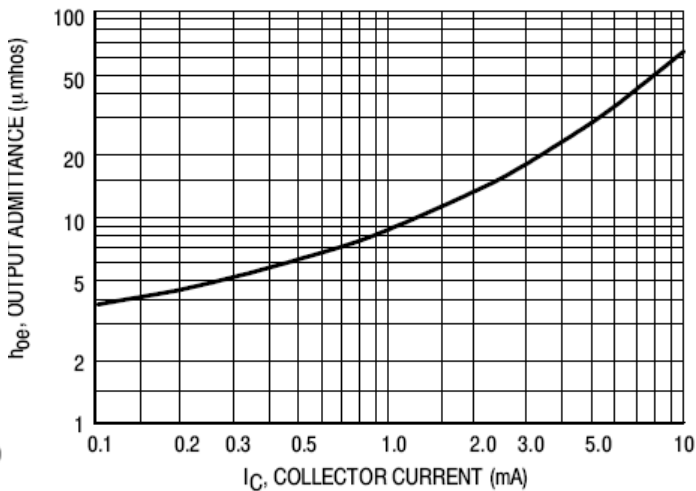


Figure 11. Input Impedance

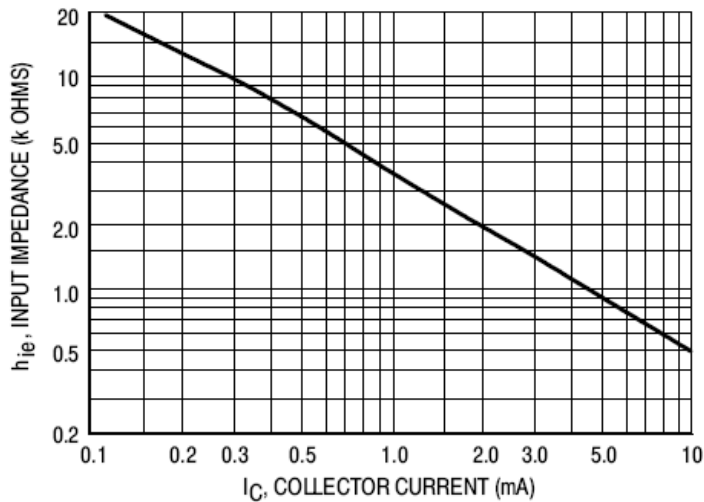


Figure 12. Voltage Feedback Ratio

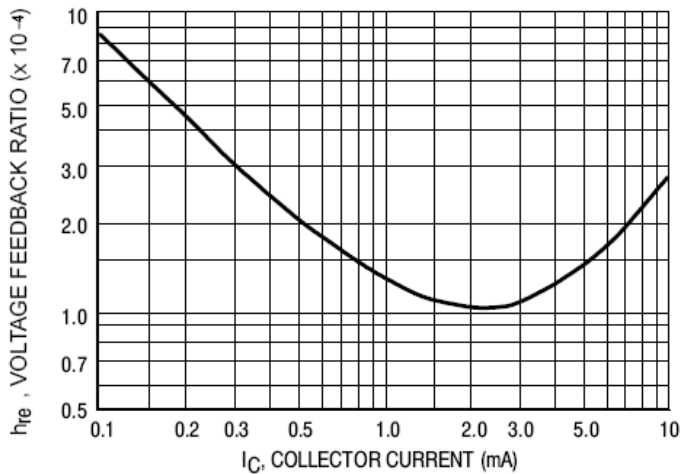


Fig.13 DC Current Gain

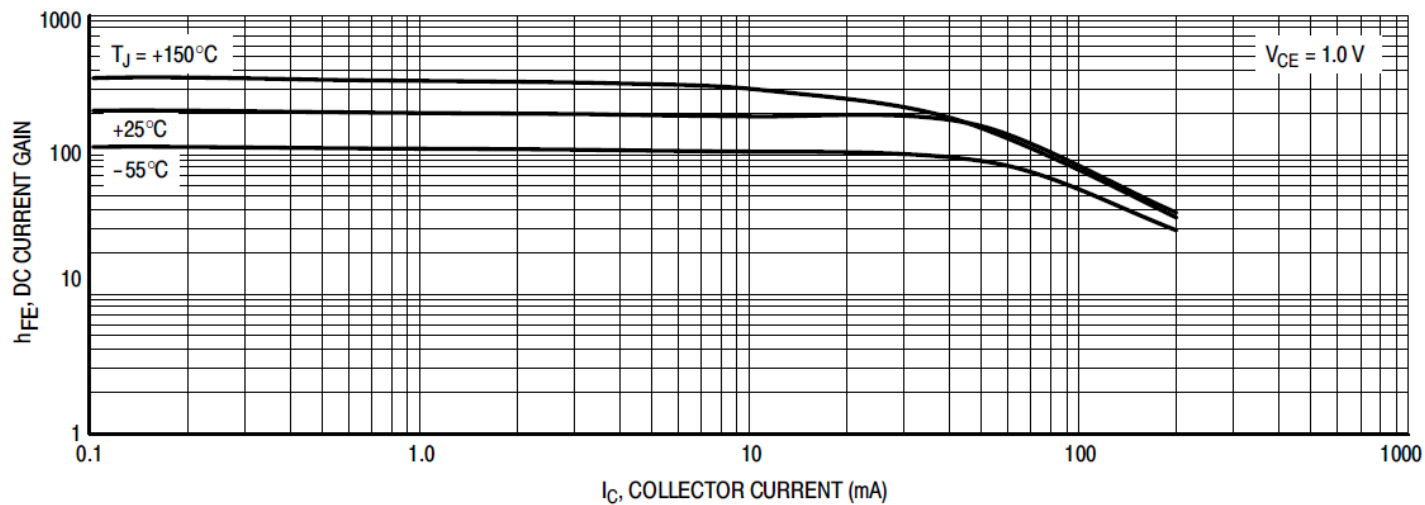


Fig.14 Collector Saturation Region

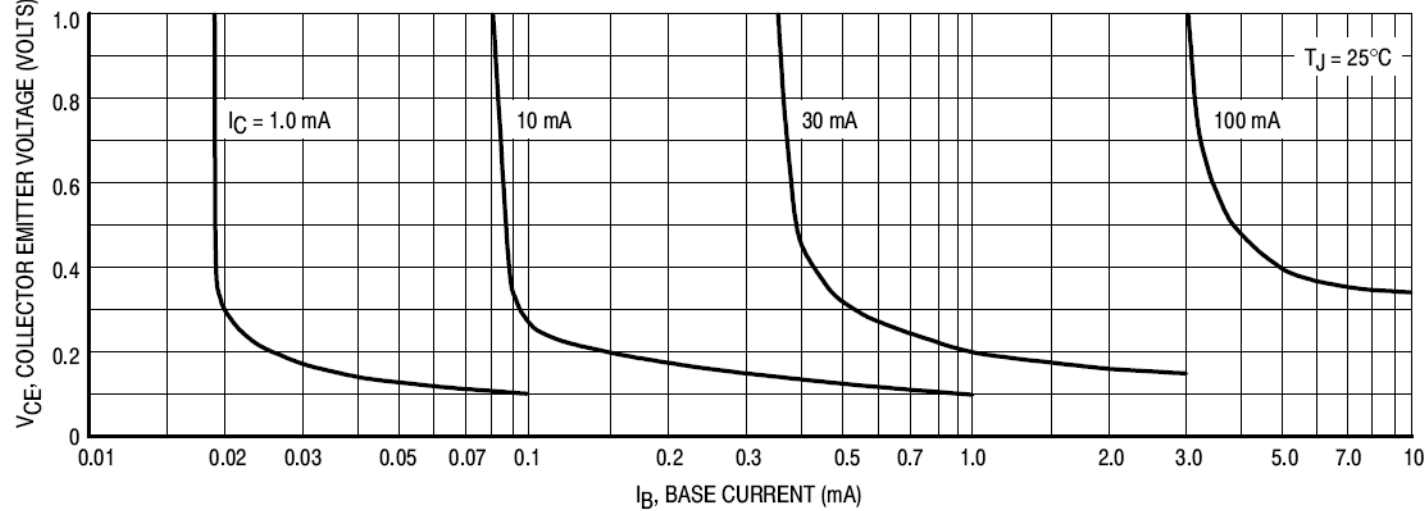
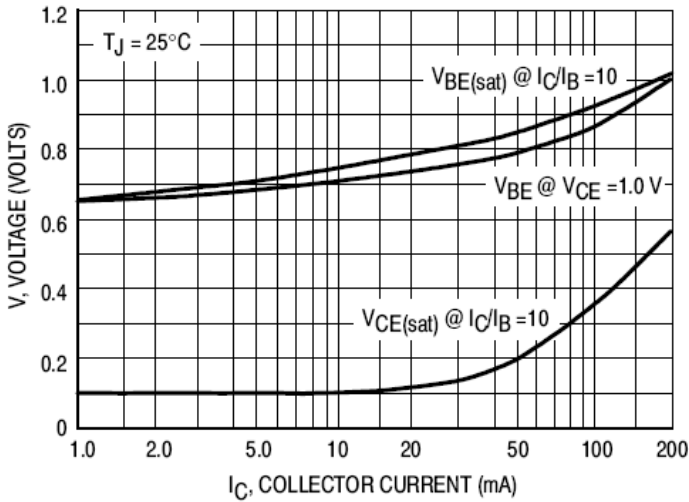
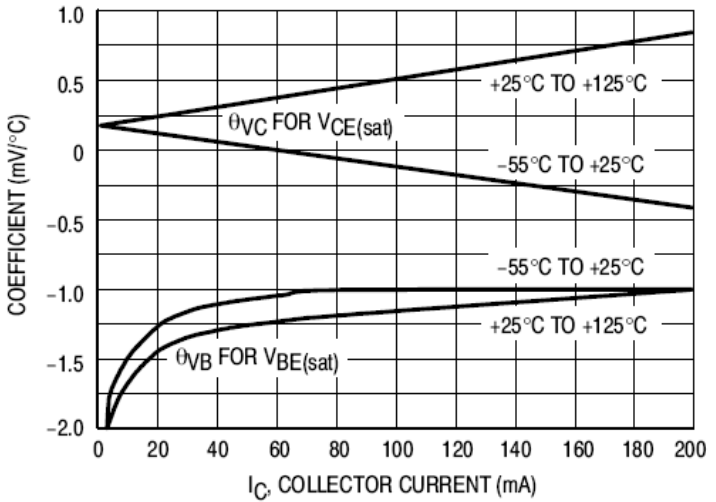


Figure 15. "ON" VoltagesFigure



16. Temperature Coefficients



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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

