

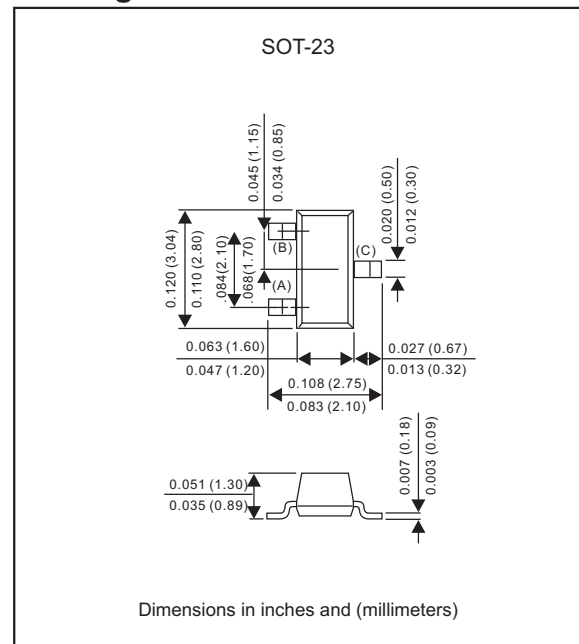
Features

- High collector-emitter breakdown voltage.
($BV_{CEO} = 140V \sim 160V @ I_C = 1mA$)
- This device is designed for general purpose high voltage amplifiers and gas discharge display driving.
- Epitaxial planar die construction.
- Lead-free parts for green partner, exceeds environmental standards of MIL-STD-19500 /228
- Compliant to Halogen-free
- Suffix "-Q1" for AEC-Q101

Mechanical data

- Epoxy: UL94-V0 rated flame retardant
- Case : Molded plastic, SOT-23
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Mounting Position : Any

Package outline



Maximum ratings (AT $T_A = 25^\circ C$ unless otherwise noted)

PARAMETER	Symbol	MMBT5550-Q1	MMBT5551-Q1	UNIT
Collector-base voltage	V_{CBO}	160	180	V
Collector-emitter voltage	V_{CEO}	140	160	V
Emitter-base voltage	V_{EBO}	6.0		V
Collector current - continuous	I_C	600		mA

Thermal characteristics

Characteristics	Symbol	Max	UNIT
Collector Power Dissipation	P_c	300	mW
Thermal resistance From Junction to ambient	$R_{\theta JA}$	416	$^\circ C/W$
Operating junction temperature range	T_J	-55 to +150	$^\circ C$
Storage temperature range	T_{STG}	-55 to +150	$^\circ C$

Electrical characteristics (AT $T_A=25^{\circ}\text{C}$ unless otherwise noted)

Off characteristics

PARAMETER	CONDITIONS	Symbol	Types	Min.	Max.	UNIT
Collector-base breakdown voltage	$I_C = 100\mu\text{A}, I_E = 0$	$V_{(BR)CBO}$	MMBT5550-Q1	160	-	V
			MMBT5551-Q1	180	-	
Collector-emitter breakdown voltage(3)	$I_C = 1.0\text{mA}, I_B = 0$	$V_{(BR)CEO}$	MMBT5550-Q1	140	-	V
			MMBT5551-Q1	160	-	
Emitter-base breakdown voltage	$I_E = 10\mu\text{A}, I_C = 0$	$V_{(BR)EBO}$	Both Types	6.0	-	V
Collector cutoff current	$V_{CB} = 100\text{V}, I_E = 0$	I_{CBO}	MMBT5550-Q1	-	100	nA
	$V_{CB} = 120\text{V}, I_E = 0$		MMBT5551-Q1	-	50	
Emitter cutoff current	$V_{EB} = 4.0\text{V}, I_C = 0$	I_{EBO}	Both Types	-	50	nA

On characteristics

PARAMETER	CONDITIONS	Symbol	Types	Min.	Max.	UNIT
DC current gain	$I_C = 1.0\text{mA}, V_{CE} = 5.0\text{V}$	h_{FE}	MMBT5550-Q1	60	-	
			MMBT5551-Q1	80	-	
	$I_C = 10\text{mA}, V_{CE} = 5.0\text{V}$		MMBT5550-Q1	60	300	
			MMBT5551-Q1	100	300	
	$I_C = 50\text{mA}, V_{CE} = 5.0\text{V}$		MMBT5550-Q1	20	-	
			MMBT5551-Q1	30	-	
Collector-emitter saturation voltage	$I_C = 10\text{mA}, I_B = 1.0\text{mA}$	$V_{CE(sat)}$	Both Types	-	0.15	V
	$I_C = 50\text{mA}, I_B = 5.0\text{mA}$		MMBT5550-Q1	-	0.25	
			MMBT5551-Q1	-	0.20	
Base-emitter saturation voltage	$I_C = 10\text{mA}, I_B = 1.0\text{mA}$	$V_{BE(sat)}$	Both Types	-	1.0	V
	$I_C = 50\text{mA}, I_B = 5.0\text{mA}$		MMBT5550-Q1	-	1.2	
			MMBT5551-Q1	-	1.0	
Collector emitter cut-off	$V_{CB} = 10\text{V}$	I_{CES}	Both Types	-	50	nA
	$V_{CB} = 75\text{V}$			-	100	

3.Pulse test : pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2.0\%$.

Rating and characteristic curves

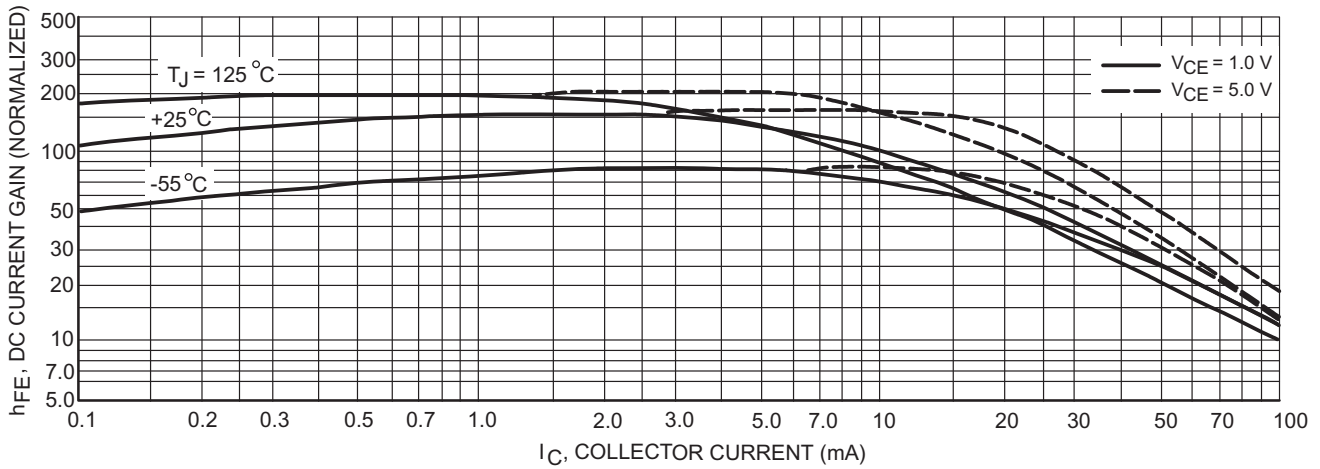


FIG.1 DC Current Gain

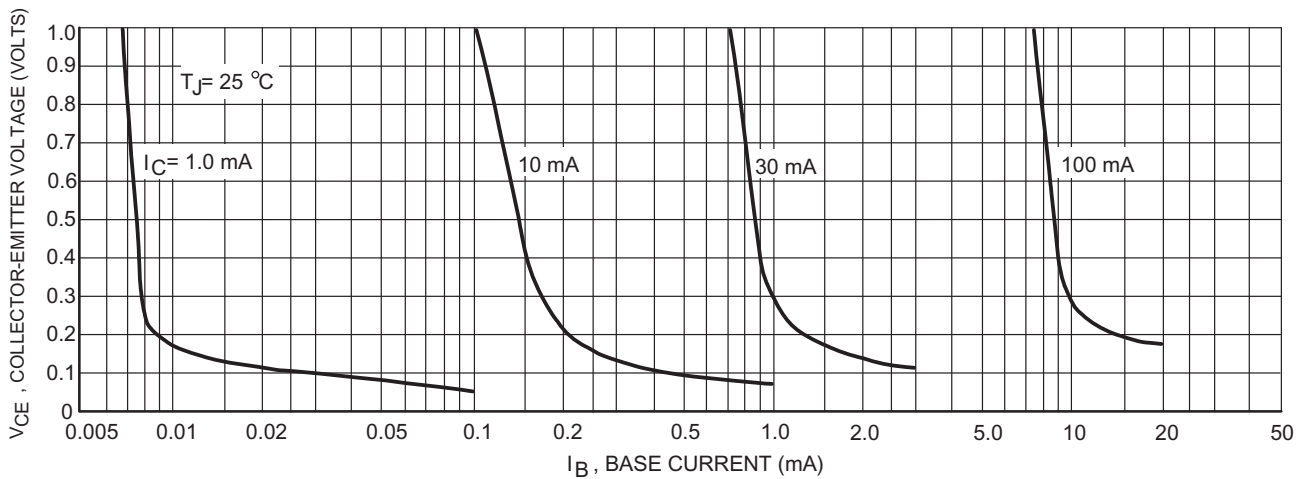


FIG. 2 Collector Saturation Region

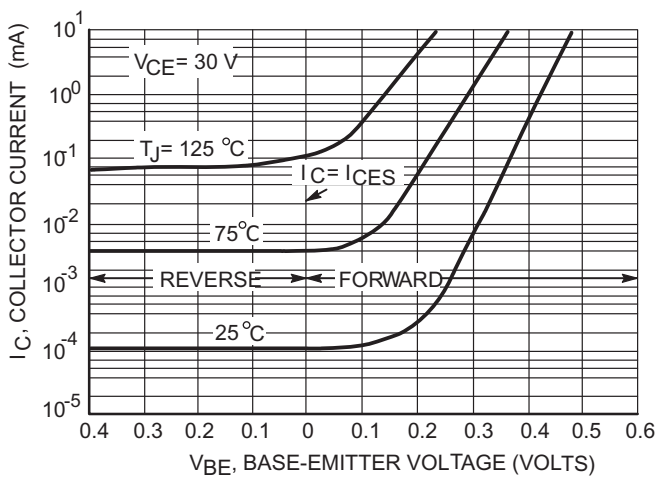


FIG. 3 Collector Cut-Off Region

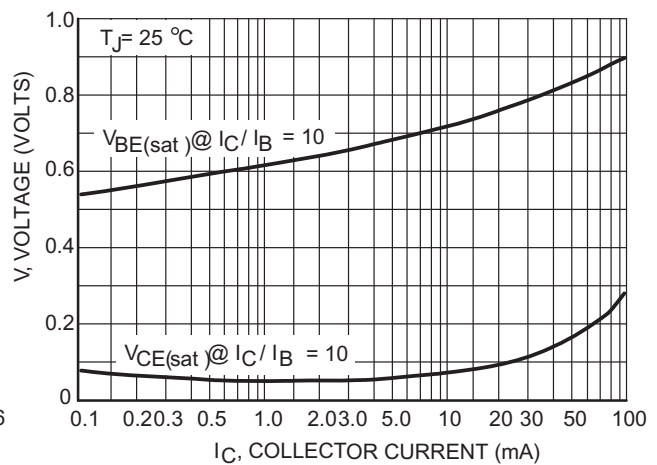


FIG. 4 "On" Voltages

Rating and characteristic curves

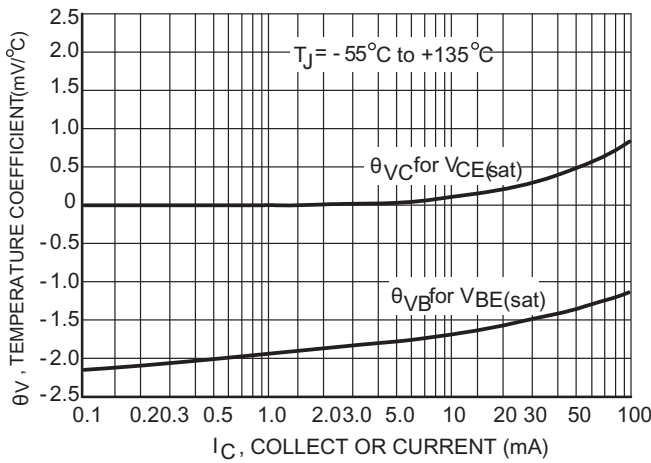
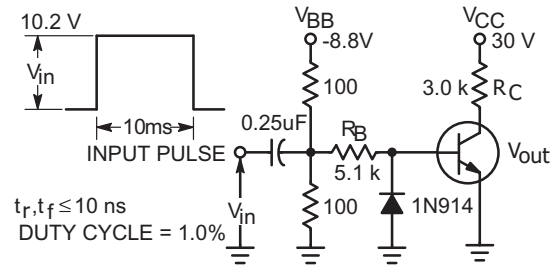


FIG.5 Temperature Coefficients



Values Shown are for $I_C @ 10$ mA

FIG. 6 Switching Time Test Circuit

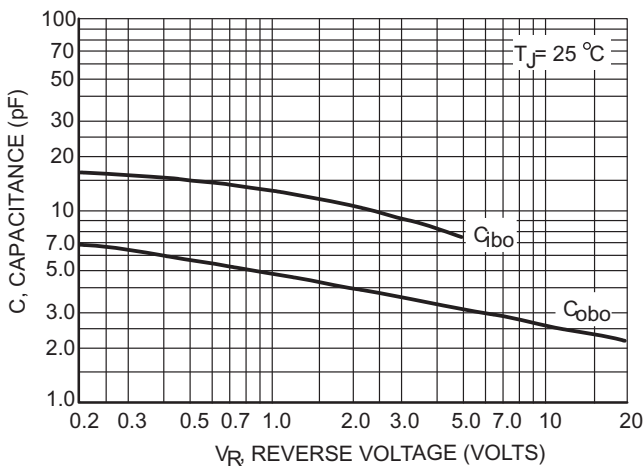


FIG. 7 Capacitances

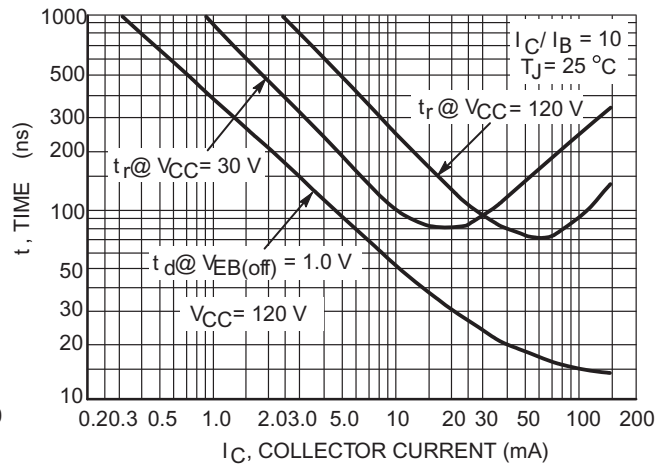


FIG. 8 Turn-On Time

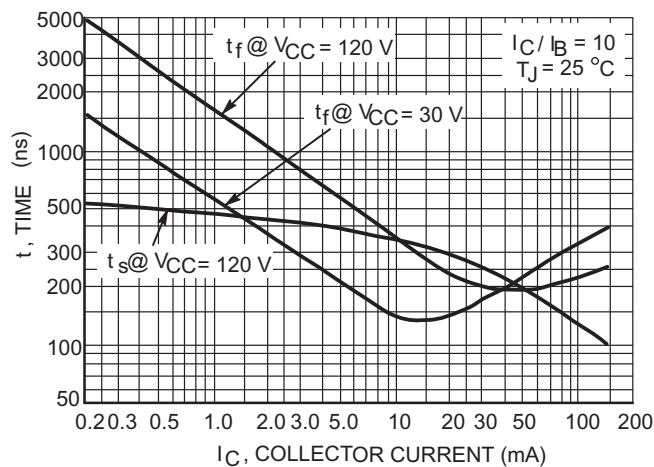
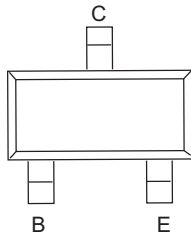
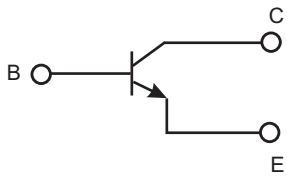


FIG.9 Turn-Off Time

Pinning information

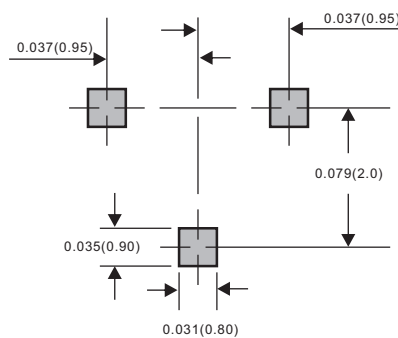
Pin	Simplified outline	Symbol
PinB Base PinC Collector PinE Emitter		

Marking

Type number	Marking code
MMBT5550-Q1	M1F
MMBT5551-Q1	G1

Suggested solder pad layout

SOT-23



Dimensions in inches and (millimeters)