MMBT5550 / MMBT5551

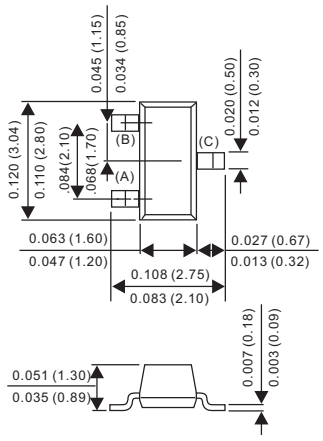
High Voltage Transistors
NPN Silicon

Features

- High collector-emitterbreakdien voltage. (BV_{CEO} = 140V~ 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
- Suffix "-H" indicates Halogen-free part, ex.MMBT5550-H.

Package outline

SOT-23



Dimensions in inches and (millimeters)

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
- Weight : Approximated 0.008 gram

Maximum ratings (AT T_A=25°C unless otherwise noted)

PARAMETER	Symbol	MMBT5550	MMBT5551	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
Total device dissipation FR-5 board (1)	T_A = 25°C	P_D	225	mW
	Derate above 25°C		1.8	mW/°C
Thermal resistance (1)	Junction to ambient	$R_{\theta JA}$	556	°C/W
Total device dissipation alumina substrate(2)	T_A = 25°C	P_D	300	mW
	Derate above 25°C		2.4	mW/°C
Thermal resistance (2)	Junction to ambient	$R_{\theta JA}$	417	°C/W
Operating junction temperature range		T_J	-55 to +150	°C
Storage temperature range		T_{STG}	-55 to +150	°C

1.FR-5 = 1.0 X 0.75 X0.062 in.
2.Alumina = 0.4 X 0.3 X 0.024 in. 99.5% alumina.

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Electrical characteristics (AT T_A=25°C unless otherwise noted)

Off characteristics

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

On characteristics

PARAMETER	CONDITIONS	Symbol	Types	Min.	Max.	UNIT
DC current gain	I_C = 1.0mA, V_{CE} = 5.0V	h_{FE}	MMBT5550	60	-	
			MMBT5551	80	-	
	I_C = 10mA, V_{CE} = 5.0V		MMBT5550	60	250	
			MMBT5551	80	250	
	I_C = 50mA, V_{CE} = 5.0V		MMBT5550	20	-	
			MMBT5551	30	-	
Collector-emitter saturation voltage	I_C = 10mA, I_B = 1.0mA	$V_{CE(sat)}$	Both Types	-	0.15	V
	I_C = 50mA, I_B = 5.0mA		MMBT5550	-	0.25	
			MMBT5551	-	0.20	
Base-emitter saturation voltage	I_C= 10mA, I_B = 1.0mA	$V_{BE(sat)}$	Both Types	-	1.0	V
	I_C = 50mA, I_B = 5.0mA		MMBT5550	-	1.2	
			MMBT5551	-	1.0	
Collector emitter cut-off	V_{CB}= 10V	I_{CES}	Both Types	-	50	nA
	V_{CB}= 75V			-	100	

3.Pulse test : pulse width≦300us, duty cycle≦2.0%.

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Rating and characteristic curves

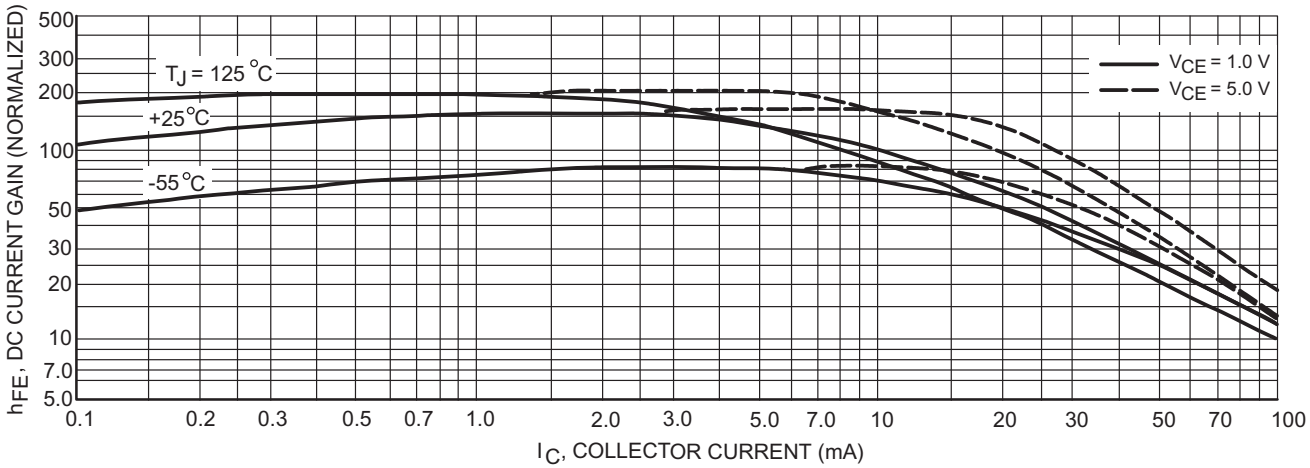

FIG.1 DC Current Gain

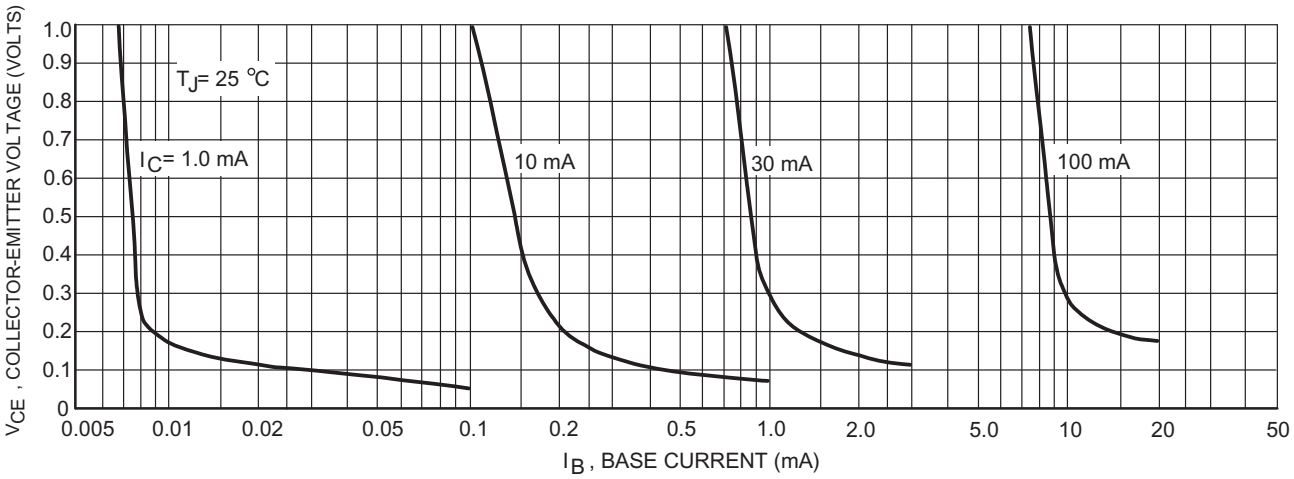

FIG. 2 Collector Saturation Region

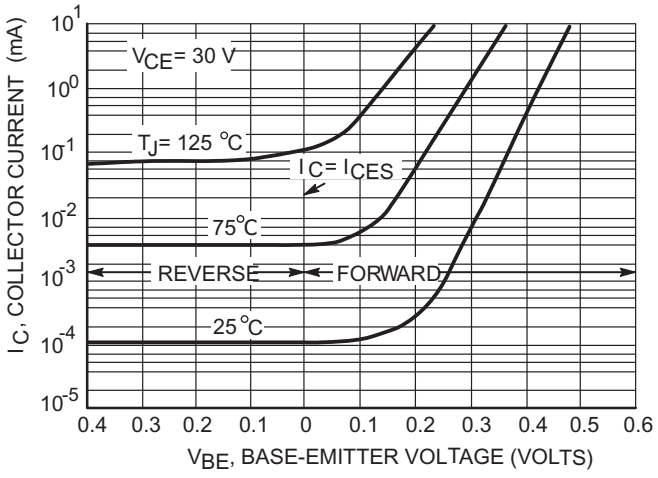

FIG. 3 Collector Cut-Off Region

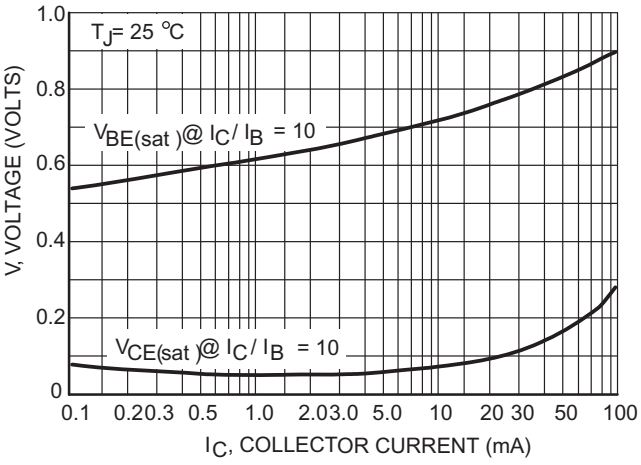

FIG. 4 "On" Voltages

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Rating and characteristic curves

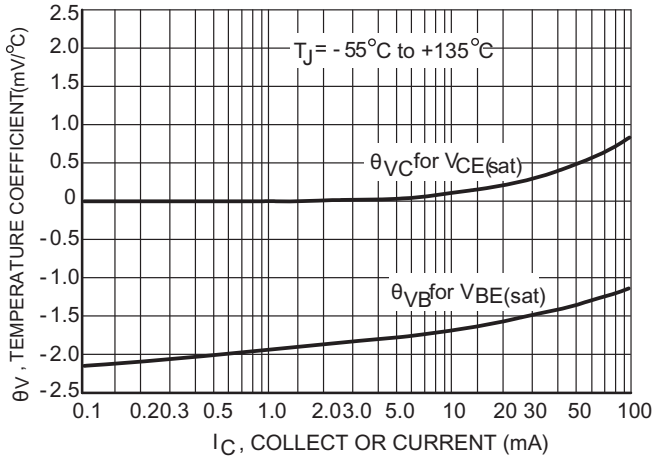
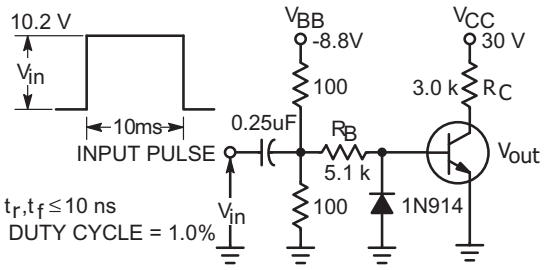


FIG.5 Temperature Coefficients



Values Shown are for I_C@ 10 mA

FIG. 6 Switching Time Test Circuit

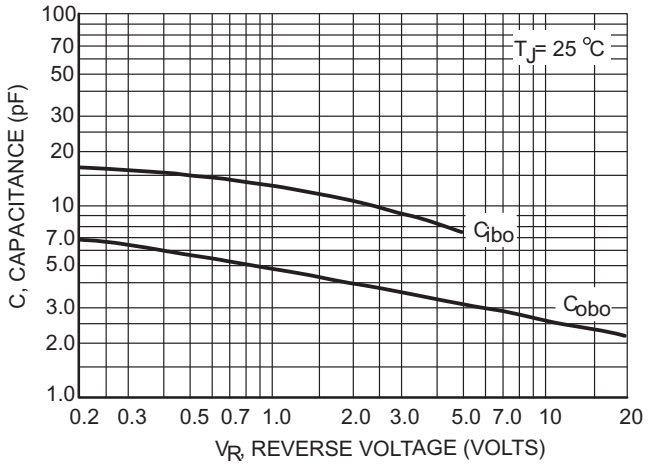


FIG. 7 Capacitances

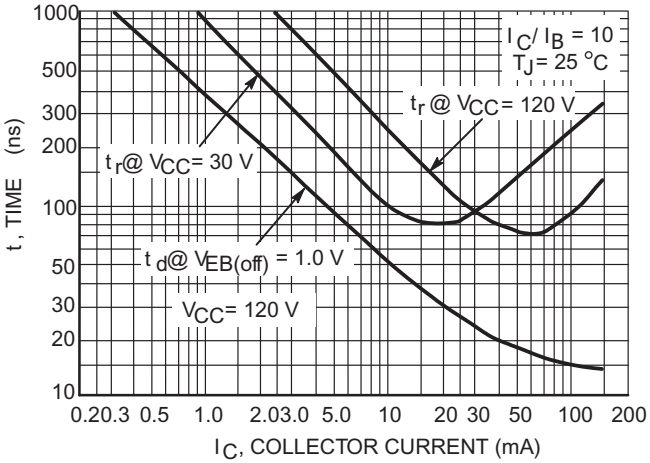


FIG. 8 Turn-On Time

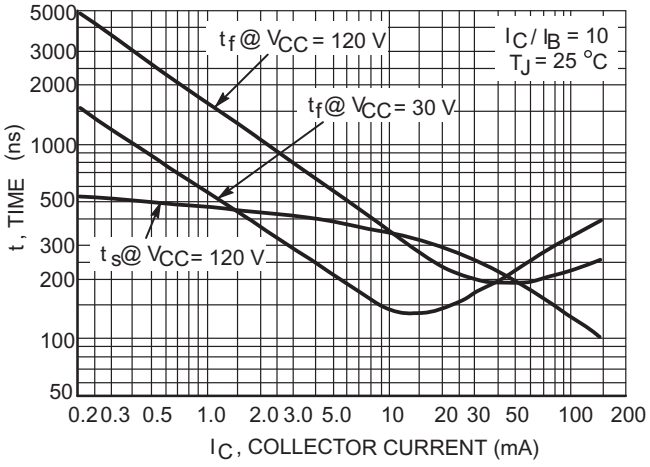


FIG.9 Turn-Off Time

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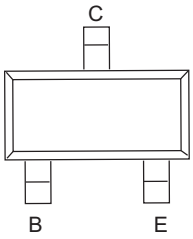
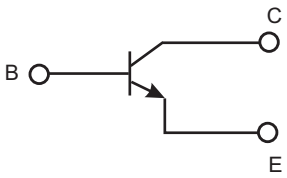
Pinning information

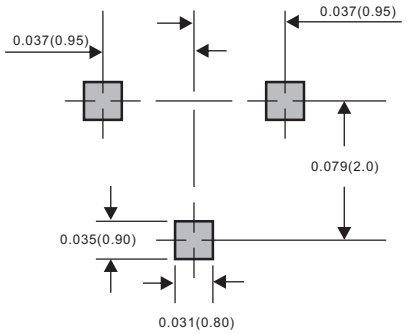
Pin	Simplified outline	Symbol
PinB Base PinC Collector PinE Emitter		

Marking

Type number	Marking code
MMBT5550	M1F
MMBT5551	G1

Suggested solder pad layout

SOT-23



Dimensions in inches and (millimeters)

Reel packing

PACKAGE	REEL SIZE	REEL (pcs)	COMPONENT SPACING (m/m)	BOX (pcs)	INNER BOX (m/m)	REEL DIA, (m/m)	CARTON SIZE (m/m)	CARTON (pcs)	APPROX. GROSS WEIGHT (kg)
SOT-23	7"	3,000	4.0	30,000	183*123*183	178	382*257*387	240,000	11.6