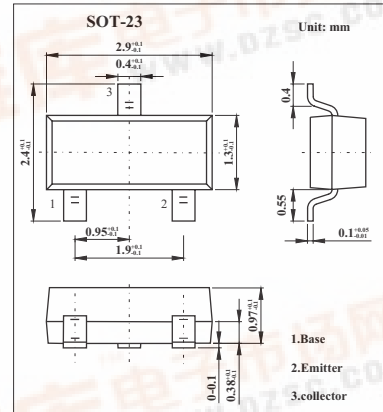
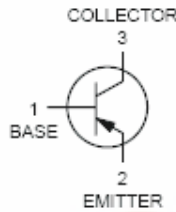


SMD Type Transistors

NPN General Purpose Amplifier
MMBT5088,MMBT5089

■ Features

- NPN general purpose amplifier



■ Absolute Maximum Ratings Ta = 25°C

Parameter	Symbol	MMBT5088	MMBT5089	Unit
Collector-emitter voltage	V _{CE0}	30	25	V
Collector-base voltage	V _{CB0}	35	30	V
Emitter-base voltage	V _{EB0}	4.5		V
Collector current	I _c	100		mA
Junction temperature	T _j	150		°C
Storage temperature	T _{stg}	-55 to +150		°C
Total device dissipation	P _D	625	350	mW
Derate above 25°C		5.0	2.8	mW/°C
Thermal resistance, junction to case	R _{θJC}	83.3		°C/W
Thermal resistance, junction to ambient	R _{θJA}	200	357	°C/W

MMBT5088,MMBT5089

■ Electrical Characteristics Ta = 25°C unless otherwise noted

Parameter	Symbol	Testconditons	Min	Typ	Max	Unit
Collector-emitter breakdown voltage	MMBT5088	$V_{(BR)CEO}$ $I_C = 1.0 \text{ mA}$, $I_B = 0$	30			V
	MMBT5089		25			
Collector-base breakdown voltage	MMBT5088	$V_{(BR)CBO}$ $I_C = 100 \mu\text{A}$, $I_E = 0$	35			V
	MMBT5089		30			
Collector-cutoff current	MMBT5088	I_{CBO} $V_{CB} = 20 \text{ V}$, $I_E = 0$			50	nA
	MMBT5089	I_{CBO} $V_{CB} = 15 \text{ V}$, $I_E = 0$			50	nA
Emitter-base cut-off current		I_{EBO} $V_{EB} = 3.0 \text{ V}$, $I_C = 0$			50	nA
		I_{EBO} $V_{EB} = 4.5 \text{ V}$, $I_C = 0$			100	nA
DC current gain	MMBT5088	h_{FE} $I_C = 100 \mu\text{A}$, $V_{CE} = 5.0 \text{ V}$	300		900	
	MMBT5089		400		1200	
Collector-emitter saturation voltage		$V_{CE(sat)}$ $I_C = 10 \text{ mA}$, $I_B = 1.0 \text{ mA}$			0.5	V
Base-emitter saturation voltage		$V_{BE(on)}$ $I_C = 10 \text{ mA}$, $V_{CE} = 5.0 \text{ V}$			0.8	V
Current gain - bandwidth product		f_T $I_C = 500 \mu\text{A}$, $V_{CE} = 5.0 \text{ mA}$, $f = 20 \text{ MHz}$	50			MHz
Collector-base capacitance		C_{cb} $V_{CB} = 5.0 \text{ V}$, $I_E = 0$, $f = 100 \text{ KHz}$			4.0	pF
Emitter-base capacitance		C_{eb} $V_{BE} = 0.5 \text{ V}$, $I_C = 0$, $f = 100 \text{ KHz}$			10	pF
Small-signal current gain	MMBT5088	h_{fe} $I_C = 1.0 \text{ mA}$, $V_{CE} = 5.0 \text{ V}$, $f = 1.0 \text{ KHz}$	350		1400	
	MMBT5089		450		1800	
Noise figure	MMBT5088	NF $I_C = 100 \mu\text{A}$, $V_{CE} = 5.0 \text{ V}$, $R_s = 10 \text{ K}\Omega$, $f = 10 \text{ Hz to } 15.7 \text{ kHz}$			3.0	dB
	MMBT5089				2.0	dB

■ hFE Classification

TYPE	MMBT5088	MMBT5089
Marking	1Q	1R