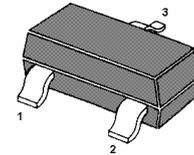




NPN Silicon Switching Transistor



1.Base 2.Emitter 3.Collector
SOT-23 Plastic Package

Absolute Maximum Ratings ($T_a = 25\text{ }^\circ\text{C}$)

Parameter	Symbol	Value	Unit
Collector Base Voltage	V_{CBO}	40	V
Collector Emitter Voltage	V_{CEO}	15	V
Collector Emitter Voltage	V_{CES}	40	V
Emitter Base Voltage	V_{EBO}	4.5	V
Collector Current Continuous	I_C	200	mA
Total Device Dissipation FR-5 Board ¹⁾	P_{tot}	200	mW
Derate above 25 °C		1.8	mW/°C
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	556	°C/W
Junction and Storage Temperature Range	T_J, T_S	-55 to +150	°C

¹⁾ FR-5=1×0.75×0.062 in.

**Characteristics at $T_{amb}=25\text{ }^{\circ}\text{C}$**

Parameter	Symbol	Min.	Max.	Unit	
DC Current Gain					
at $V_{CE}=1\text{V}$, $I_C=10\text{mA}$	MMBT2369	h_{FE}	40	120	-
at $V_{CE}=1\text{V}$, $I_C=10\text{mA}$	MMBT2369A	h_{FE}	-	120	-
at $V_{CE}=0.35\text{V}$, $I_C=10\text{mA}$	MMBT2369A	h_{FE}	40	-	-
at $V_{CE}=0.35\text{V}$, $I_C=10\text{mA}$, $T_A=-55\text{ }^{\circ}\text{C}$	MMBT2369A	h_{FE}	20	-	-
at $V_{CE}=0.4\text{V}$, $I_C=30\text{mA}$	MMBT2369A	h_{FE}	30	-	-
at $V_{CE}=2.0\text{V}$, $I_C=100\text{mA}$	MMBT2369	h_{FE}	20	-	-
at $V_{CE}=1.0\text{V}$, $I_C=100\text{mA}$	MMBT2369A	h_{FE}	20	-	-
Collector Emitter Saturation Voltage					
at $I_C=10\text{mA}$, $I_B=1\text{mA}$	MMBT2369	V_{CEsat}	-	0.25	V
at $I_C=10\text{mA}$, $I_B=1\text{mA}$	MMBT2369A	V_{CEsat}	-	0.2	V
at $I_C=10\text{mA}$, $I_B=1\text{mA}$, $T_A=+125\text{ }^{\circ}\text{C}$	MMBT2369A	V_{CEsat}	-	0.3	V
at $I_C=30\text{mA}$, $I_B=3.0\text{mA}$	MMBT2369A	V_{CEsat}	-	0.25	V
at $I_C=100\text{mA}$, $I_B=10\text{mA}$	MMBT2369A	V_{CEsat}	-	0.5	V
Base Emitter Saturation Voltage					
at $I_C=10\text{mA}$, $I_B=1\text{mA}$	MMBT2369A	V_{BEsat}	0.7	0.85	V
at $I_C=10\text{mA}$, $I_B=1\text{mA}$, $T_A=-55\text{ }^{\circ}\text{C}$	MMBT2369A	V_{BEsat}	-	1.02	V
at $I_C=30\text{mA}$, $I_B=3\text{mA}$	MMBT2369A	V_{BEsat}	-	1.15	V
at $I_C=100\text{mA}$, $I_B=10\text{mA}$	MMBT2369A	V_{BEsat}	-	1.60	V
Collector Cutoff Current					
at $V_{CE}=20\text{V}$	MMBT2369A	I_{CES}	-	0.4	μA
Collector Cutoff Current					
at $V_{CB}=20\text{V}$		I_{CBO}	-	0.4	μA
at $V_{CB}=20\text{V}$, $T_A=150\text{ }^{\circ}\text{C}$		I_{CBO}	-	30	μA
Collector Emitter Breakdown Voltage					
at $I_C=10\text{mA}$		$V_{(BR)CEO}$	15	-	V
Collector Base Breakdown Voltage					
at $I_C=10\mu\text{A}$		$V_{(BR)CBO}$	40	-	V
Collector Emitter Breakdown Voltage					
at $I_C=10\mu\text{A}$		$V_{(BR)CES}$	40	-	V
Emitter Base Breakdown Voltage					
at $I_E=10\mu\text{A}$		$V_{(BR)EBO}$	4.5	-	V



Characteristics at $T_{amb}=25\text{ }^{\circ}\text{C}$

Parameter	Symbol	Min.	Typ.	Max.	Unit
Output Capacitance at $V_{CB}=5\text{V}$, $f=1\text{MHz}$	C_{obo}	-	-	4	pF
Small Signal Current Gain at $I_C=10\text{mA}$, $V_{CE}=10\text{V}$, $f=100\text{MHz}$	H_{fe}	5.0	-	-	-
Storage Time $I_{B1}=I_{B2}=I_C=10\text{mA}$	t_s	-	5.0	13	ns
Turn-On Time $V_{CC}=3\text{V}$, $I_C=10\text{mA}$, $I_{B1}=3\text{mA}$	t_{on}	-	8.0	12	ns
Turn-Off Time $V_{CC}=3\text{V}$, $I_C=10\text{mA}$, $I_{B1}=3.0\text{mA}$, $I_{B2}=1.5\text{mA}$	t_{off}	-	10	18	ns