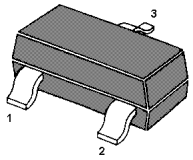
NPN Silicon Switching Transistor



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

Absolute Maximum Ratings (T_a = 25 °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)] Derate above 25 °C	P_{tot}	200 1.8	mW 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.

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Characteristics at T_{amb}=25 °C

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

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Characteristics at T_{amb}=25 °C

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

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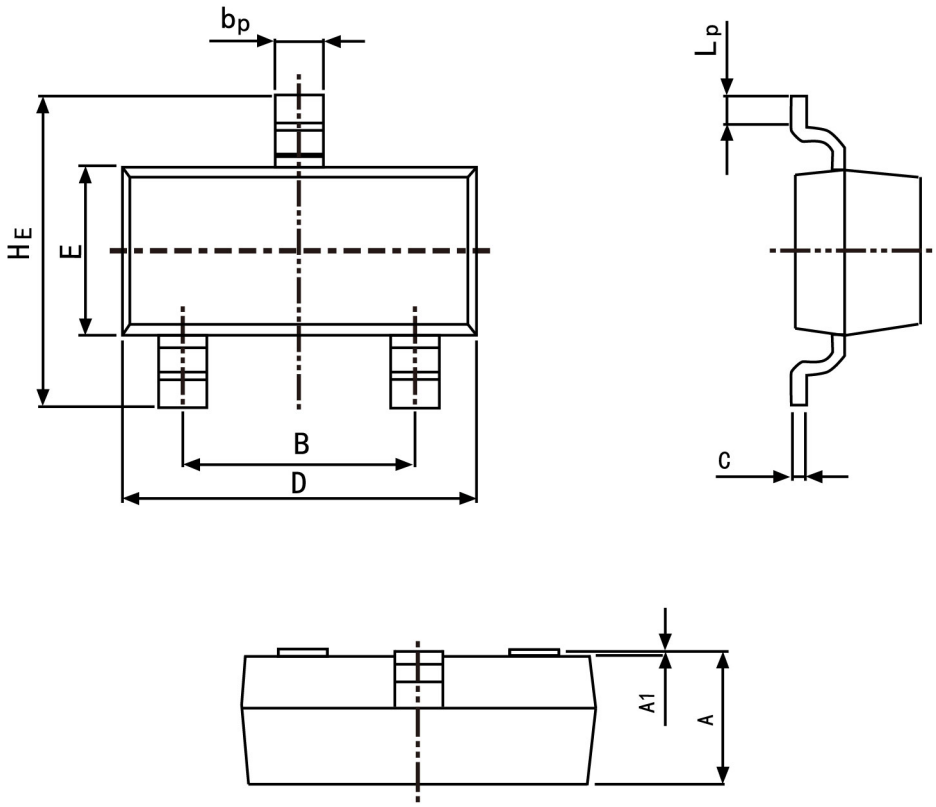
PACKAGE OUTLINE

Plastic surface mounted package; 3 leads **SOT-23**



Symbol	Dimension in Millimeters	
	Min	Max
A	0.95	1.40
B	1.78	2.04
bp	0.35	0.50
C	0.08	0.19
D	2.70	3.10
E	1.20	1.65
HE	2.20	3.00
A1	0.100	0.013
Lp	0.20	0.50

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