



SOT-23 Plastic-Encapsulate Transistors

MMBT4401 TRANSISTOR (NPN)

FEATURES

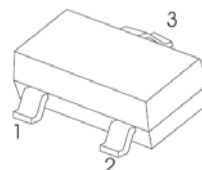
- Switching Transistor

MARKING:2X

MAXIMUM RATINGS ($T_a=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Value	Unit
V_{CB0}	Collector-Base Voltage	60	V
V_{CEO}	Collector-Emitter Voltage	40	V
V_{EBO}	Emitter-Base Voltage	6	V
I_C	Collector Current	600	mA
P_C	Collector Power Dissipation	300	mW
$R_{\theta JA}$	Thermal Resistance From Junction To Ambient	417	$^{\circ}\text{C}/\text{W}$
T_j	Junction Temperature	150	$^{\circ}\text{C}$
T_{stg}	Storage Temperature	-55~+150	$^{\circ}\text{C}$

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1. BASE
2. EMITTER
3. COLLECTOR

ELECTRICAL CHARACTERISTICS ($T_a=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C=100\mu\text{A}$, $I_E=0$	60			V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C=1\text{mA}$, $I_B=0$	40			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E=100\mu\text{A}$, $I_C=0$	6			V
Collector cut-off current	I_{CEO}	$V_{CE}=30\text{V}$, $I_B=0$			100	nA
Collector cut-off current	I_{CBO}	$V_{CB}=50\text{V}$, $I_E=0$			100	nA
Emitter cut-off current	I_{EBO}	$V_{EB}=5\text{V}$, $I_C=0$			100	nA
DC current gain	h_{FE}	$V_{CE}=1\text{V}$, $I_C=150\text{mA}$	100		300	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C=150\text{mA}$, $I_B=15\text{mA}$			0.4	V
Collector-emitter saturation voltage	$V_{BE(sat)}$	$I_C=150\text{mA}$, $I_B=15\text{mA}$			0.95	V
Transition frequency	f_T	$V_{CE}=10\text{V}$, $I_C=20\text{mA}$, $f=100\text{MHz}$	250			MHz
Delay time	t_d	$V_{CC}=30\text{V}$, $V_{BE(off)}=-2\text{V}$, $I_C=150\text{mA}$, $I_{B1}=15\text{mA}$			15	ns
Rise time	t_r				20	ns
Storage time	t_s	$V_{CC}=30\text{V}$, $I_C=150\text{mA}$, $I_{B1}=I_{B2}=15\text{mA}$			225	ns
Fall time	t_f				30	ns