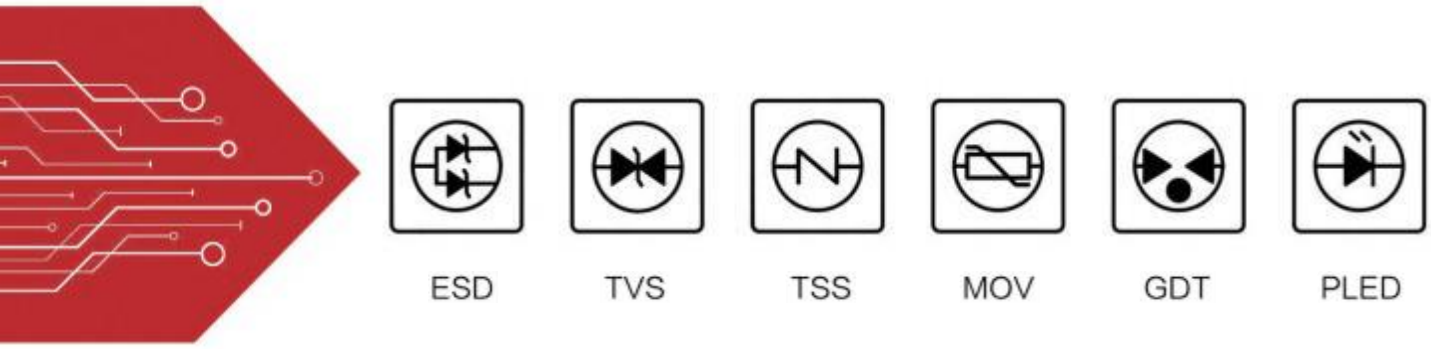
MSKSEMI
SEMICONDUCTOR



Product data sheet

FMMT493 TRANSISTOR (NPN)

SOT－23

1. BASE
2. EMITTER
3. COLLECTOR

FEATURES

- Complementary Type FMMT593

MARKING:493

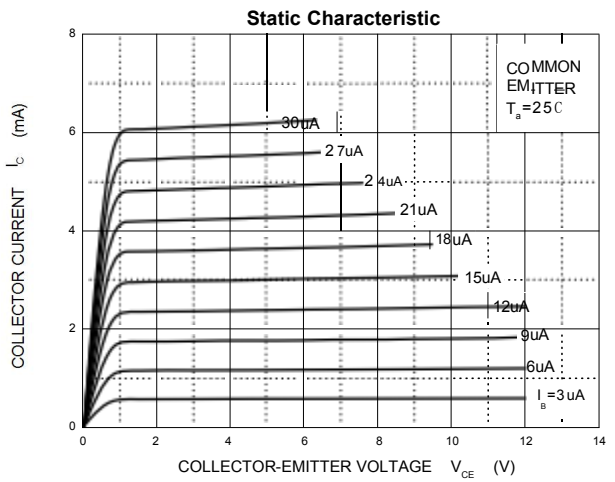
MAXIMUM RATINGS (T_a=25℃ unless otherwise noted)

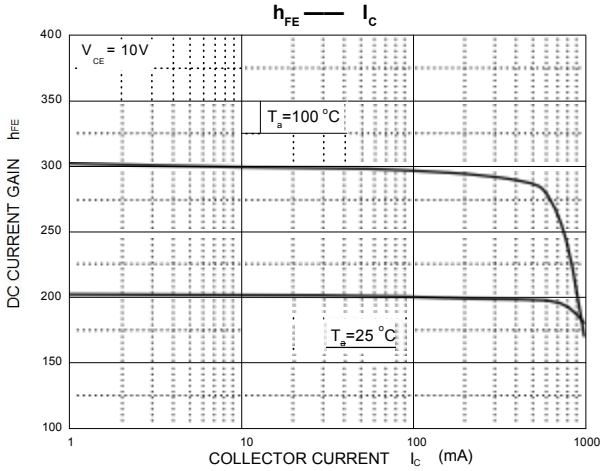
Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage	120	V
V_{CEO}	Collector-Emitter Voltage	100	V
V_{EBO}	Emitter-Base Voltage	5	V
I_C	Collector Current	1000	mA
P_C	Collector Power Dissipation	250	mW
$R_{\Theta JA}$	Thermal Resistance From Junction To Ambient	500	℃/W
T_j	Junction Temperature	150	℃
T_{stg}	Storage Temperature	-55~+150	℃

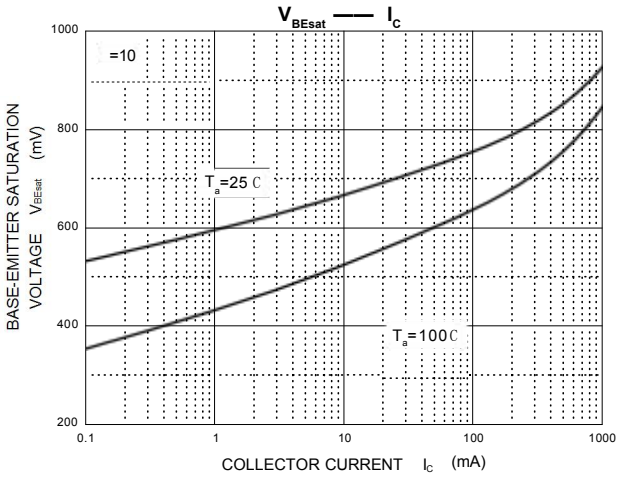
ELECTRICAL CHARACTERISTICS (T_a=25℃ unless otherwise specified)

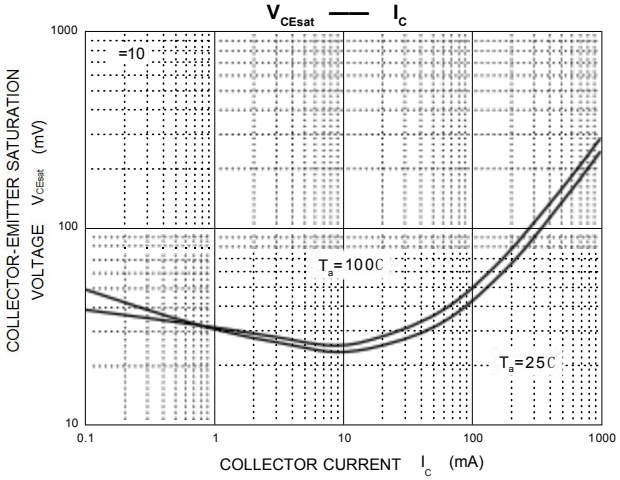
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	I_C=100μA, I_E=0	120			V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	I_C=10mA, I_B=0	100			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	I_E=100μA, I_C=0	5			V
Collector cut-off current	I_{CBO}	V_{CB}=100V, I_E=0			0.1	μA
Collector cut-off current	I_{CES}	V_{CES}=100V, I_E=0			0.1	μA
Emitter cut-off current	I_{EBO}	V_{EB}=4V, I_C=0			0.1	μA
DC current gain	$h_{FE(1)}$*	V_{CE}=10V, I_C=1mA	100			
	$h_{FE(2)}$*	V_{CE}=10V, I_C=250mA	100		300	
	$h_{FE(3)}$*	V_{CE}=10V, I_C=0.5A	60			
	$h_{FE(4)}$*	V_{CE}=10V, I_C=1A	20			
Collector-emitter saturation voltage	$V_{CE(sat)1}$*	I_C=500mA, I_B=50mA			0.3	V
	$V_{CE(sat)2}$*	I_C=1A, I_B=100mA			0.6	V
Base-emitter saturation voltage	$V_{BE(sat)}$*	I_C=1A, I_B=100mA			1.15	V
Base-emitter voltage	V_{BE}*	V_{CE}=10V, I_C=1A			1	V
Transition frequency	f_T	V_{CE}=10V,I_C=50mA, f=100MHz	150			MHz
Collector output capacitance	C_{ob}	V_{CB}=10V, I_E=0, f=1MHz			10	pF

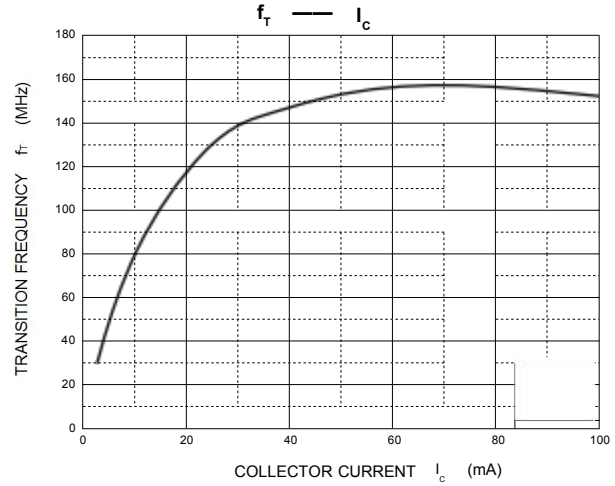
*Pulse test: pulse width ≤300μs, duty cycle≤ 2.0%.

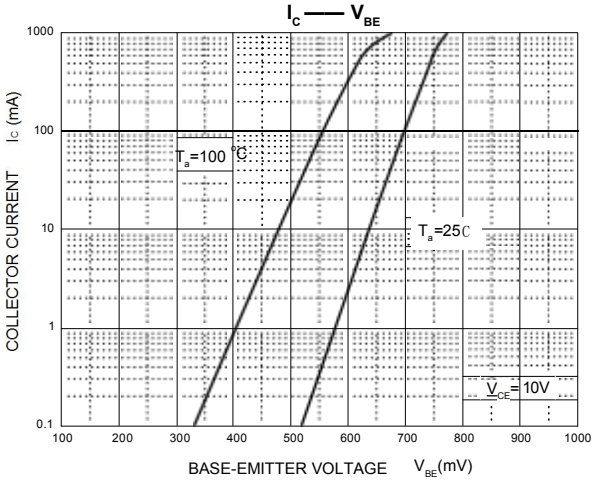

Static Characteristic
COMMON EMITTER
Ta=25℃
30uA
27uA
24uA
21uA
18uA
15uA
12uA
9uA
6uA
IB=3uA
COLLECTOR CURRENT IC (mA)
COLLECTOR-EMITTER VOLTAGE VCE (V)

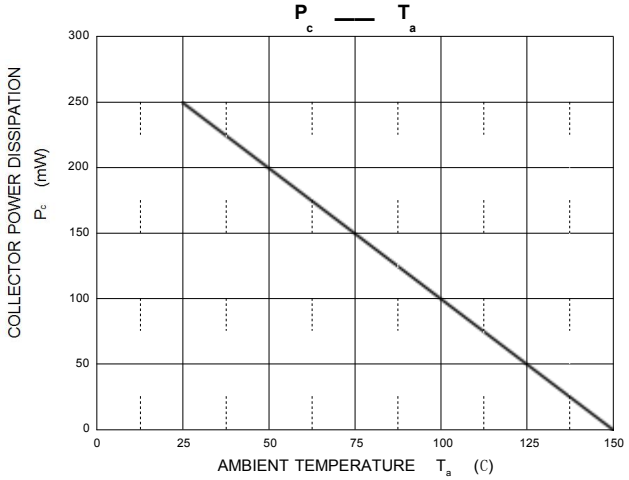

hFE —— IC
VCE= 10V
Ta=100 ℃
Ta=25 ℃
DC CURRENT GAIN hFE
COLLECTOR CURRENT IC (mA)


VBEsat —— IC
=10
Ta=25 ℃
Ta=100℃
BASE-EMITTER SATURATION VOLTAGE VBEsat (mV)
COLLECTOR CURRENT IC (mA)

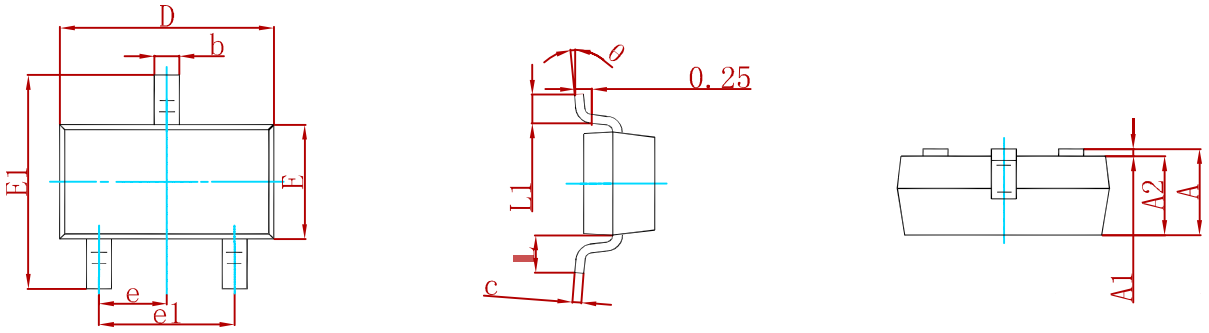

VCEsat —— IC
=10
Ta=100℃
Ta=25℃
COLLECTOR-EMITTER SATURATION VOLTAGE VCEsat (mV)
COLLECTOR CURRENT IC (mA)


fT —— IC
TRANSITION FREQUENCY fT (MHz)
COLLECTOR CURRENT IC (mA)


IC —— VBE
Ta=100 ℃
Ta=25℃
VCE= 10V
COLLECTOR CURRENT IC (mA)
BASE-EMITTER VOLTAGE VBE(mV)

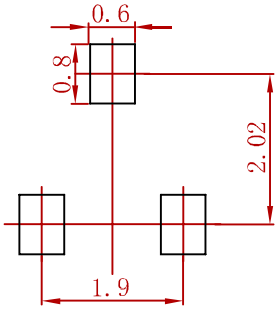

Pc —— Ta
COLLECTOR POWER DISSIPATION Pc (mW)
AMBIENT TEMPERATURE Ta (℃)

PACKAGE MECHANICAL DATA



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

Suggested Pad Layout



Note:
1.Controlling dimension:in millimeters.
2.General tolerance:±0.05mm.
3.The pad layout is for reference purposes only.

REEL SPECIFICATION

P/N	PKG	QTY
FMMT493	SOT-23	3000

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