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SEMICONDUCTOR



ESD



TVS



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MOV



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PLED

MMBT3904DFN

Product specification

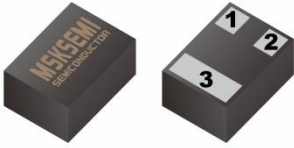
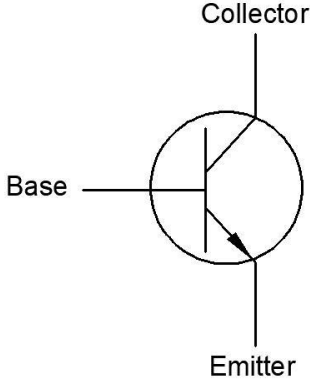

Features

- Low profile package
- Ideal for automated placement
- Low saturation voltages
- High voltage capability
- High Stability and High Reliability
- RoHS Compliant

Applications

- amplifying signal
- Electronic switch
- Oscillating circuit
- Variable resistance
- Lighting applications

Appearance & Symbol

PACKAGE OUTLINE	Pin Configuration	Marking
 <p>1: Base 2: Emitter 3: Collector</p>		
<p>DFN1006-3</p>		

Absolute Maximum Ratings (T=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	60	V
Collector-Emitter Voltage	V_{CEO}	40	V
Emitter-Base Voltage	V_{EBO}	6	V
Collector Current Continuous	I_C	0.2	A
Power Dissipation	P_D	0.3	W
Operating Junction temperature	T_J	-55 to +150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C

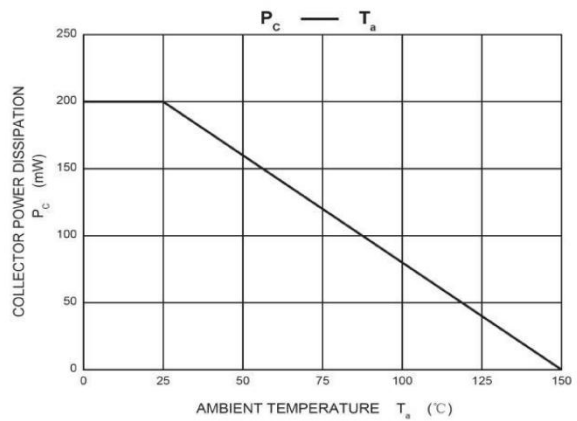
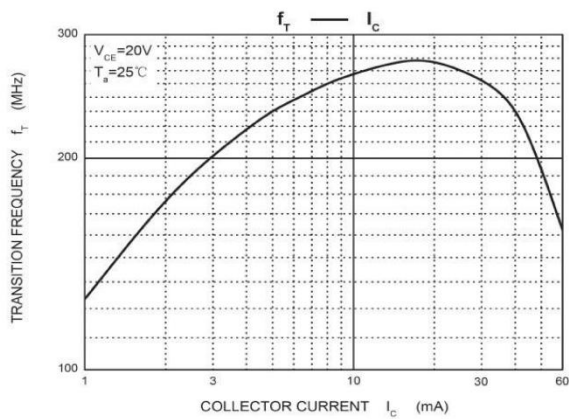
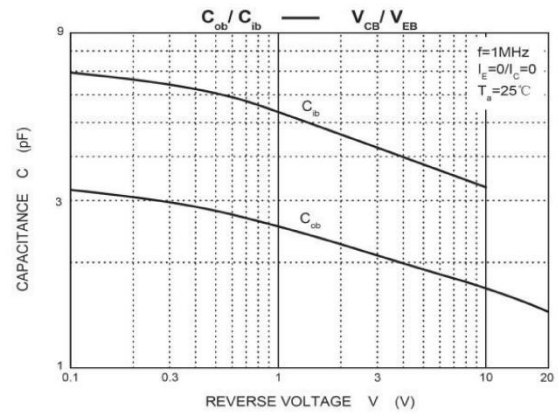
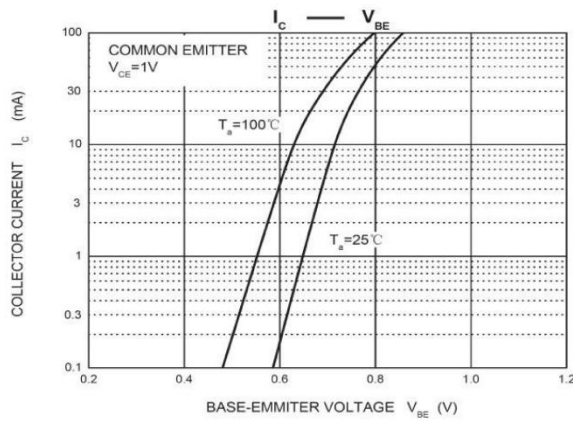
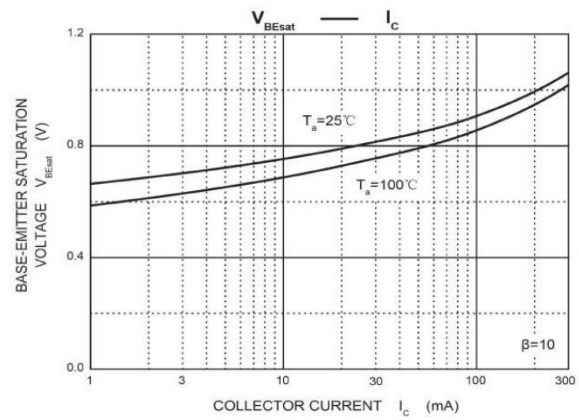
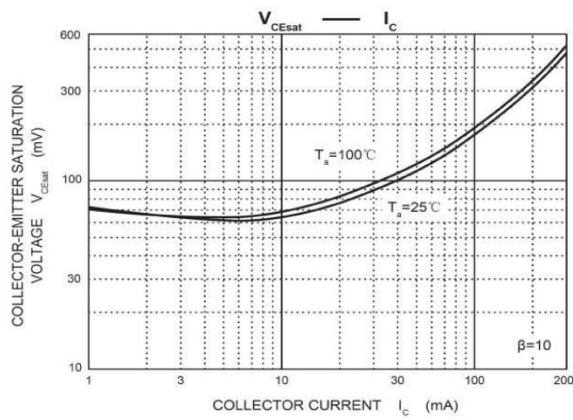
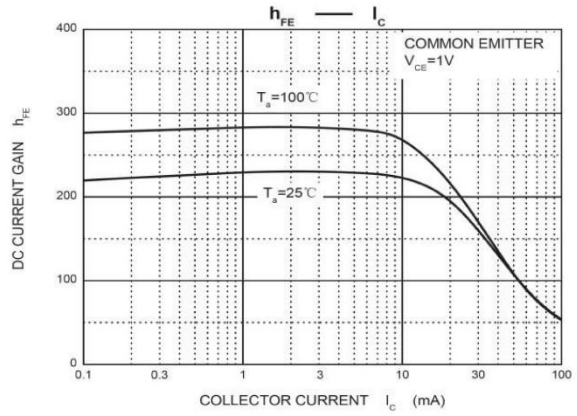
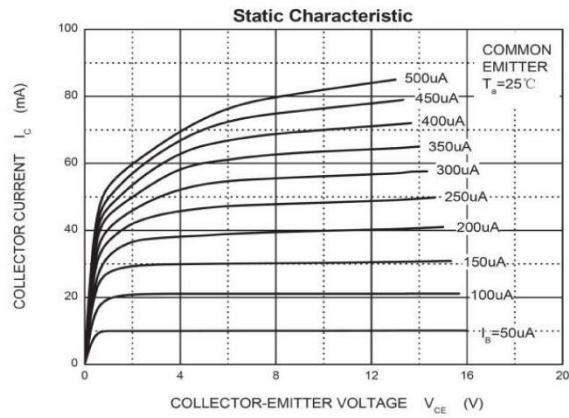
Electrical Characteristics (T=25°C unless otherwise noted)

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-Base Breakdown Voltage	V_{CBO}	$I_C=10\mu A, I_E=0$	60			V
Collector-Emitter Breakdown Voltage	V_{CER}	$I_C=1mA, I_B=0$	40			V
Emitter-Base Breakdown Voltage	V_{EBO}	$I_E=10\mu A, I_C=0$	6			V
Collector Cut-Off Current	I_{CBO}	$V_{CB}=60V, I_E=0$			100	nA
Collector Cut-Off Current	I_{CEX}	$V_{CE}=30V, V_{EB(off)}=3V$			50	nA
Emitter Cut-Off Current	I_{EBO}	$V_{EB}=5V, I_C=0$			100	nA
DC current gain	h_{FE}	$V_{CE}=1V, I_C=0.1mA$	40			
		$V_{CE}=1V, I_C=1mA$	70			
		$V_{CE}=1V, I_C=10mA$	100		300	
		$V_{CE}=1V, I_C=50mA$	60			
		$V_{CE}=1V, I_C=100mA$	30			
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C=50mA, I_B=5mA$			0.3	V
Base -emitter saturation voltage	$V_{BE(sat)}$	$I_C=50mA, I_B=5mA$			0.95	V
Transition frequency	f_T	$V_{CE}=20V, I_C=10mA, f=100MHz$	300			MHZ
Delay Time	t_d	$V_{CC}=3V, I_C=10mA, V_{BE(off)}=-0.5V, I_{B1}=1mA$		35		
Rise time	t_r			35		ns
Storage time	t_s	$V_{CC}=3V, I_C=10mA, I_{B1}=I_{B2}=1mA$		200		us
Fall time	t_f			50		ns

Classification of h_{FE}

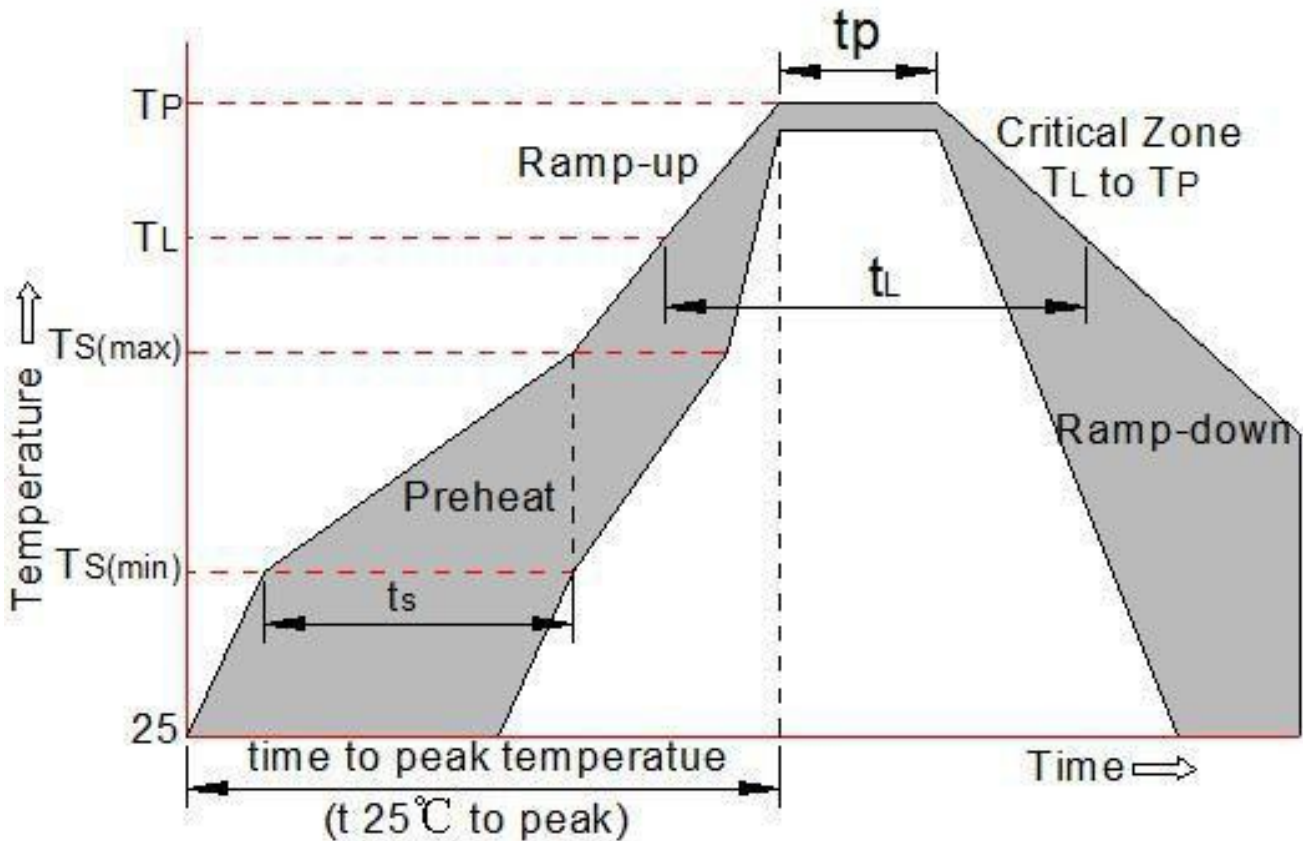
Range	100-300
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Typical Characteristics

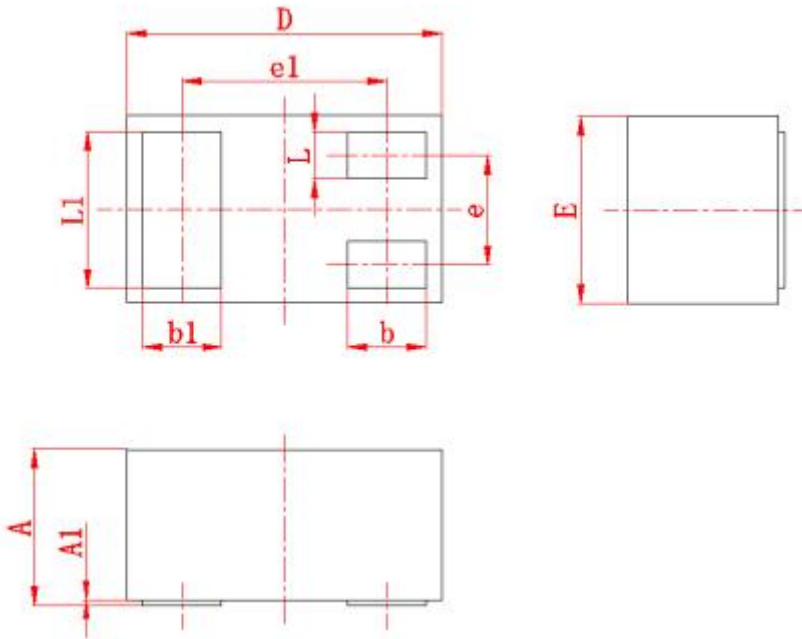


Soldering parameters

Reflow Condition		Pb-Free assembly (see as bellow)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150°C
	-Temperature Max($T_{s(max)}$)	+200°C
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3°C/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3°C/sec. Max
Reflow	-Temperature(T_L) (Liquid us)	+217°C
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_p)		+260(+0/-5)°C
Time within 5°C of actual Peak Temp (t_p)		30 secs. Max
Ramp-down Rate		6°C/sec. Max
Time 25°C to Peak Temp (T_P)		8 min. Max
Do not exceed		+260°C

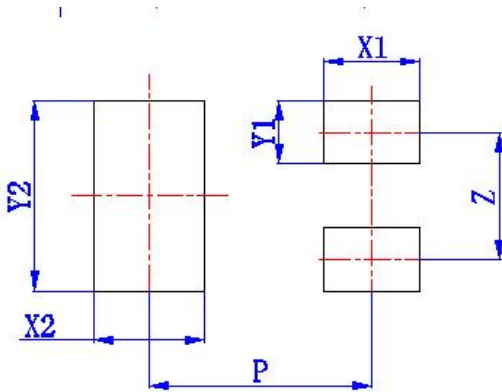


Package mechanical data



Symbol	Millimeters	
	min	max
A	0.4	0.5
A1	0	0.05
D	0.9	1.1
E	0.55	0.65
e	(0.35)	
e1	(0.65)	
b	0.2	0.3
b1	0.2	0.3
L	0.1	0.2
L1	0.45	0.55

Suggested Land Pattern



Symbol	Dimension in Millimeters
	typ
X1	(0.3)
X2	(0.35)
Y1	(0.2)
Y2	(0.6)
Z	(0.4)
P	(0.7)

REEL SPECIFICATION

P/N	PKG	QTY
MMBT3904DFN	DFN1006-3	10000

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