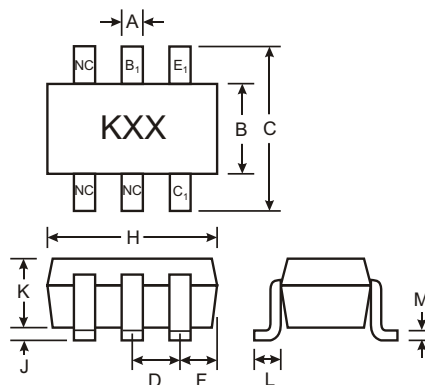


Features

- Epitaxial Planar Die Construction
- Ideal for Low Power Amplification and Switching
- Ultra-Small Surface Mount Package

Mechanical Data

- Case: SOT-363, Molded Plastic
- Terminals: Solderable per MIL-STD-202, Method 208
- Terminal Connections: See Diagram
- Marking: 6M
- Weight: 0.006 grams (approx.)



SOT-363		
Dim	Min	Max
A	0.10	0.30
B	1.15	1.35
C	2.00	2.20
D	0.65 Nominal	
F	0.30	0.40
H	1.80	2.20
J	—	0.10
K	0.90	1.00
L	0.25	0.40
M	0.10	0.25
All Dimensions in mm		

Maximum Ratings @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	MMDT3904S	Unit
Collector-Base Voltage	V_{CBO}	60	V
Collector-Emitter Voltage	V_{CEO}	40	V
Emitter-Base Voltage	V_{EBO}	6.0	V
Collector Current - Continuous (Note 1)	I_C	200	mA
Power Dissipation (Note 1)	P_d	200	mW
Thermal Resistance, Junction to Ambient (Note 1)	$R_{\theta JA}$	625	K/W
Operating and Storage and Temperature Range	T_j, T_{STG}	-55 to +150	$^\circ\text{C}$

- Notes:
1. Valid provided that terminals are kept at ambient temperature.
 2. Pulse test: Pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.

Electrical Characteristics

Characteristic	Symbol	Min	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 2)					
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	60	—	V	$I_C = 10\mu A, I_E = 0$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	40	—	V	$I_C = 1.0mA, I_B = 0$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	5.0	—	V	$I_E = 10\mu A, I_C = 0$
Collector Cutoff Current	I_{CEX}	—	50	nA	$V_{CE} = 30V, V_{EB(OFF)} = 3.0V$
Base Cutoff Current	I_{BL}	—	50	nA	$V_{CE} = 30V, V_{EB(OFF)} = 3.0V$
ON CHARACTERISTICS (Note 2)					
DC Current Gain	h_{FE}	40 70 100 60 30	— — 300 — —	—	$I_C = 100\mu A, V_{CE} = 1.0V$ $I_C = 1.0mA, V_{CE} = 1.0V$ $I_C = 10mA, V_{CE} = 1.0V$ $I_C = 50mA, V_{CE} = 1.0V$ $I_C = 100mA, V_{CE} = 1.0V$
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	—	0.20 0.30	V	$I_C = 10mA, I_B = 1.0mA$ $I_C = 50mA, I_B = 5.0mA$
Base- Emitter Saturation Voltage	$V_{BE(SAT)}$	0.65 —	0.85 0.95	V	$I_C = 10mA, I_B = 1.0mA$ $I_C = 50mA, I_B = 5.0mA$
SMALL SIGNAL CHARACTERISTICS					
Output Capacitance	C_{obo}	—	4.0	pF	$V_{CB} = 5.0V, f = 1.0MHz, I_E = 0$
Input Capacitance	C_{ibo}	—	8.0	pF	$V_{EB} = 0.5V, f = 1.0MHz, I_C = 0$
Input Impedance	h_{ie}	1.0	10	k Ω	$V_{CE} = 10V, I_C = 1.0mA,$ $f = 1.0kHz$
Voltage Feedback Ratio	h_{re}	0.5	8.0	x 10 ⁻⁴	
Small Signal Current Gain	h_{fe}	100	400	—	
Output Admittance	h_{oe}	1.0	40	μS	
Current Gain-Bandwidth Product	f_T	300	—	MHz	$V_{CE} = 20V, I_C = 10mA,$ $f = 100MHz$
Noise Figure	NF	—	5.0	dB	$V_{CE} = 5.0V, I_C = 100\mu A,$ $R_S = 1.0k\Omega, f = 1.0kHz$
SWITCHING CHARACTERISTICS					
Delay Time	t_d	—	35	ns	$V_{CC} = 3.0V, I_C = 10mA,$ $V_{BE(off)} = -0.5V, I_{B1} = 1.0mA$
Rise Time	t_r	—	35	ns	
Storage Time	t_s	—	200	ns	$V_{CC} = 3.0V, I_C = 10mA,$ $I_{B1} = I_{B2} = 1.0mA$
Fall Time	t_f	—	50	ns	

- Notes: 1. Valid provided that terminals are kept at ambient temperature.
 2. Pulse test: Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.