



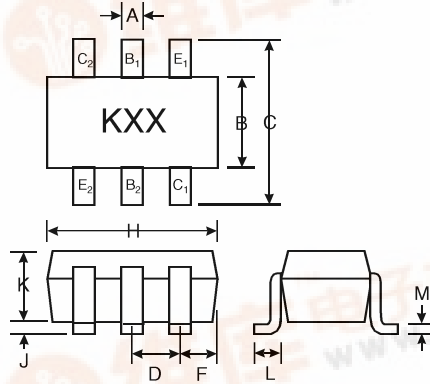
DUAL NPN SMALL SIGNAL SURFACE MOUNT TRANSISTOR

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: K6N
- 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 @ $T_A = 25\text{ C}$ unless otherwise specified

Characteristic	Symbol	MMDT3904	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_{JA}	625	K/W
Operating and Storage and Temperature Range	T_j, T_{STG}	-55 to +150	C

- Notes:
- Valid provided that terminals are kept at ambient temperature.
 - Pulse test: Pulse width 300 μ s, duty cycle 2%.

Electrical Characteristics @ $T_A = 25\text{ }^\circ\text{C}$ unless otherwise specified

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

- Notes: 1. Valid provided that terminals are kept at ambient temperature.
2. Pulse test: Pulse width 300 μs , duty cycle 2%.