

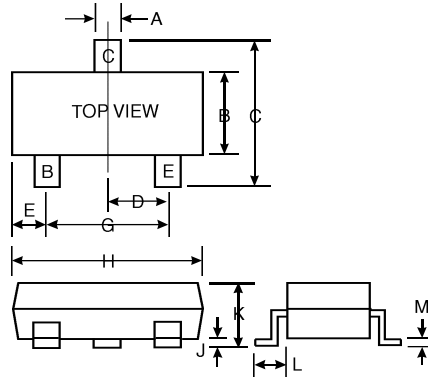


### Features

- Epitaxial Planar Die Construction
- Complementary NPN Type Available (MMST3904)
- Ultra-Small Surface Mount Package

### Mechanical Data

- Case: SOT-323, Molded Plastic
- Terminals: Solderable per MIL-STD-202, Method 208
- Terminal Connections: See Diagram
- Marking: K5N
- Weight: 0.006 grams (approx.)



SOT-323		
Dim	Min	Max
A	0.30	0.40
B	1.15	1.35
C	2.00	2.20
D	0.65 Nominal	
E	0.30	0.40
G	1.20	1.40
H	1.80	2.20
J	0.0	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	MMST3906	Unit
Collector-Base Voltage	$V_{CBO}$	-40	V
Collector-Emitter Voltage	$V_{CEO}$	-40	V
Emitter-Base Voltage	$V_{EBO}$	-5.0	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

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

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

Characteristic	Symbol	Min	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 2)</b>					
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	-40		V	$I_C = -10\text{ A}, I_E = 0$
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	$I_E = -10\text{ A}, I_C = 0$
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	$V_{CE} = -30\text{ V}, V_{EB(OFF)} = -3.0\text{ V}$
<b>ON CHARACTERISTICS (Note 2)</b>					
DC Current Gain	$h_{FE}$	60 80 100 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	$I_C = -10\text{ mA}, I_B = -1.0\text{ mA}$ $I_C = -50\text{ mA}, I_B = -5.0\text{ mA}$
<b>SMALL SIGNAL CHARACTERISTICS</b>					
Output Capacitance	$C_{obo}$		4.5	pF	$V_{CB} = -5.0\text{ V}, f = 1.0\text{ MHz}, I_E = 0$
Input Capacitance	$C_{ibo}$		10	pF	$V_{EB} = -0.5\text{ V}, f = 1.0\text{ MHz}, I_C = 0$
Input Impedance	$h_{ie}$	2.0	12	k	$V_{CE} = 1.0\text{ V}, I_C = 10\text{ mA}, f = 1.0\text{ kHz}$
Voltage Feedback Ratio	$h_{re}$	0.1	10	$\times 10^{-4}$	
Small Signal Current Gain	$h_{fe}$	100	400		
Output Admittance	$h_{oe}$	3.0	60	S	
Current Gain-Bandwidth Product	$f_T$	300		MHz	
Noise Figure	NF		4.0	dB	$V_{CE} = -5.0\text{ V}, I_C = -100\text{ A}, R_S = 1.0\text{ k } f = 1.0\text{ kHz}$
<b>SWITCHING CHARACTERISTICS</b>					
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	$t_s$		225	ns	$V_{CC} = -3.0\text{ V}, I_C = -10\text{ mA}, I_{B1} = I_{B2} = -1.0\text{ mA}$
Fall Time	$t_f$		75	ns	

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