

M·C·C·

Micro Commercial Components



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MMST3904

Features

- Epitaxial Planar Die Construction
- Complementary PNP Type available (MMST3906)
- Ultra-small surface mount package
- Marking : K2N
- Lead Free Finish/RoHS Compliant ("P" Suffix designates RoHS Compliant. See ordering information)
- Epoxy meets UL 94 V-0 flammability rating
- Moisure Sensitivity Level 1
- Halogen free available upon request by adding suffix "-HF"

Maximum Ratings

Symbol	Rating	Rating	Unit
V_{CEO}	Collector-Emitter Voltage	40	V
V_{CBO}	Collector-Base Voltage	60	V
V_{EBO}	Emitter-Base Voltage	6.0	V
I_C	Collector Current-Continuous ⁽¹⁾	200	mA
P_C	Power dissipation ⁽¹⁾	200	mW
T_J	Junction Temperature	-55 to +150	°C
T_{STG}	Storage Temperature	-55 to +150	°C

Electrical Characteristics @ 25°C Unless Otherwise Specified

Symbol	Parameter	Min	Max	Units
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage ($I_E=1.0\text{mA}$, $I_B=0$)	40	---	Vdc
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage ($I_E=10\text{uA}$, $I_B=0$)	60	---	Vdc
$V_{(BR)EBO}$	Collector-Emitter Breakdown Voltage ($I_E=10\text{uA}$, $I_B=0$)	5.0	---	Vdc
I_{CEX}	Collector-Base Cutoff Current ($V_{CE}=30\text{Vdc}$, $V_{EB(\text{OFF})}=3.0\text{Vdc}$)	---	50	nAdc
I_{BL}	Emitter-Base Cutoff Current ($V_{CE}=30\text{Vdc}$, $V_{EB(\text{OFF})}=3.0\text{Vdc}$)	---	50	nAdc

ON CHARACTERISTICS⁽²⁾

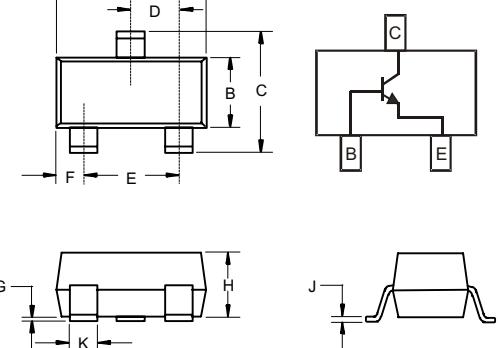
h_{FE}	DC Current Gain ($I_B=100\text{uAdc}$, $V_{CE}=1.0\text{Vdc}$) ($I_B=1.0\text{mA}$, $V_{CE}=1.0\text{Vdc}$) ($I_B=10\text{mA}$, $V_{CE}=1.0\text{Vdc}$) ($I_B=50\text{mA}$, $V_{CE}=1.0\text{Vdc}$) ($I_B=500\text{mA}$, $V_{CE}=1.0\text{Vdc}$)	40 70 100 60 30	---	---
$V_{CE(\text{sat})}$	Collector-Emitter Saturation Voltage ($I_B=10\text{mA}$, $I_E=1.0\text{mA}$) ($I_B=50\text{mA}$, $I_E=5.0\text{mA}$)	---	0.25 0.30	Vdc
$V_{BE(\text{sat})}$	Base-Emitter Saturation Voltage ($I_B=10\text{mA}$, $I_E=1.0\text{mA}$) ($I_B=50\text{mA}$, $I_E=5.0\text{mA}$)	0.65 ---	0.85 0.95	Vdc

Note: 1. Valid provided that terminals are kept at ambient temperature.

2. Pulse test: Pulse width<300us, duty cycle<2%

NPN Small Signal Transistors

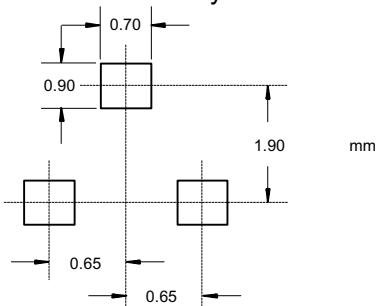
SOT-323



DIMENSIONS

DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	.071	.087	1.80	2.20	
B	.045	.053	1.15	1.35	
C	.083	.096	2.10	2.45	
D	.026 Nominal		0.65Nominal		
E	.047	.055	1.20	1.40	
F	.012	.016	.30	.40	
G	.000	.004	.000	.100	
H	.035	.039	.90	1.00	
J	.004	.010	.100	.250	
K	.006	.016	.15	.40	

Suggested Solder Pad Layout



SMALL SIGNAL CHARACTERISTICS

C_{obo}	Output Capacitance ($V_{CB}=5.0$ Vdc, $f=1.0$ MHz, $I_E=0$)	---	4.0	pF
C_{ibo}	Input Capacitance ($V_{EB}=0.5$ Vdc, $f=1.0$ MHz, $I_C=0$)	---	8.0	pF
h_{ie}	Input Impedance	$V_{CE}=10$ Vdc, $I_C=1.0$ mAdc, $f=1.0$ KHz	1.0	10 kohms
h_{re}	Voltage Feedback Ratio		0.5	$\times 10^{-4}$
h_{fe}	Small Signal Current Gain		100	400
h_{oe}	Output Admittance		1.0	40 uS
f_T	Current Gain-Bandwidth Product ($V_{CE}=20$ Vdc, $I_C=10$ mAdc, $f=100$ MHz)	300	---	MHz
NF	Noise Figure ($V_{CE}=5.0$ Vdc, $I_C=100$ uAdc, $R_S=1.0$ KOHMS, $f=1.0$ KHz)	---	5.0	dB

SWITCHING CHARACTERISTICS

td	Delay Time	$V_{CC}=3.0$ Vdc, $I_C=100$ uAdc,	---	35	ns
tr	Rise Time	$V_{BE(off)}=0.5$ Vdc, $I_{B1}=1.0$ mAdc	---	35	ns

Ordering Information :

Device	Packing
Part Number-TP	Tape&Reel; 3Kpcs/Reel

Note : Adding "-HF" suffix for halogen free, eg. Part Number-TP-HF

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