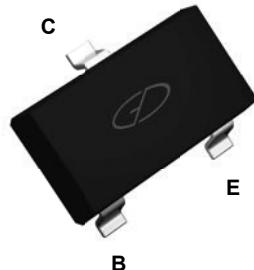
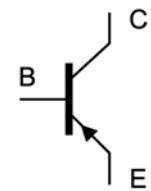


## Features

- Complementary to MMST3904
- Epoxy meets UL 94 V-0 flammability rating
- Small outline surface mount package



SOT-323



Schematic Diagram

## Absolute Maximum Ratings ( $T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Collector-Base Voltage	$V_{CBO}$	-40	V
Collector-Emitter Voltage	$V_{CEO}$	-40	V
Emitter-Base Voltage	$V_{EBO}$	-5	V
Collector Current-Continuous	$I_C$	-200	mA
Collector Power Dissipation	$P_C$	200	mW
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	625	°C/W
Junction Temperature	$T_J$	150	°C
Storage Temperature	$T_{STG}$	-55 to +150	°C

**Electrical Characteristics** ( $T_A=25^\circ\text{C}$  unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Max	Unit
Collector-Base Breakdown Voltage <sup>1</sup>	$V_{(\text{BR})\text{CBO}}$	$I_C=-10\mu\text{A}, I_E=0$	-40	-	V
Collector-Emitter Breakdown Voltage <sup>1</sup>	$V_{(\text{BR})\text{CEO}}$	$I_C=-1\text{mA}, I_B=0$	-40	-	V
Emitter-Base Breakdown Voltage <sup>1</sup>	$V_{(\text{BR})\text{EBO}}$	$I_E=-10\mu\text{A}, I_C=0$	-5	-	V
Base Cut-Off Current <sup>1</sup>	$I_{BL}$	$V_{CE}=-30\text{V}, V_{EB(\text{off})}=-3\text{V}$	-	-50	nA
Collector Cut-Off Current <sup>1</sup>	$I_{CEX}$	$V_{CE}=-30\text{V}, V_{EB(\text{off})}=-3\text{V}$	-	-50	nA
DC Current Gain <sup>1</sup>	$h_{FE}$	$V_{CE}=-1\text{V}, I_C=-100\mu\text{A}$	60	-	-
		$V_{CE}=-1\text{V}, I_C=-1\text{mA}$	80	-	-
		$V_{CE}=-1\text{V}, I_C=-10\text{mA}$	100	300	-
		$V_{CE}=-1\text{V}, I_C=-50\text{mA}$	60	-	-
Collector-Emitter Saturation Voltage <sup>1</sup>	$V_{CE(\text{sat})}$	$I_C=-10\text{mA}, I_B=-1\text{mA}$	-	-0.2	V
		$I_C=-50\text{mA}, I_B=-5\text{mA}$	-	-0.3	V
Base-Emitter Saturation Voltage <sup>1</sup>	$V_{BE(\text{sat})}$	$I_C=-10\text{mA}, I_B=-1\text{mA}$	-0.65	-0.85	V
		$I_C=-50\text{mA}, I_B=-5\text{mA}$	-	-0.95	V
Transition Frequency	$f_T$	$V_{CE}=-20\text{V}, I_C=-10\text{mA}, F=100\text{MHz}$	250	-	MHz
Collector Output Capacitance	$C_{ob}$	$V_{CB}=-5\text{V}, I_E=0, F=1\text{MHz}$	-	4.5	pF
Collector Output Capacitance	$C_{ib}$	$V_{EB}=-0.5\text{V}, I_E=0, F=1\text{MHz}$	-	10	pF
Delay Time	$t_d$	$V_{CC}=-3\text{V}, V_{BE(\text{off})}=-0.5\text{V}, I_C=-10\text{mA}, I_{B1}=-1\text{mA}$	-	35	nS
Rise Time	$t_r$		-	35	nS
Storage Time	$t_s$	$V_{CC}=3\text{V}, I_C=-10\text{mA}, I_{B1}=I_{B2}=-1\text{mA}$	-	225	nS
Fall Time	$t_f$		-	75	nS

Note:

1. Pulse test: pulse width  $\leq 300\mu\text{s}$ , duty cycle  $\leq 2.0\%$ .

## Ratings and Characteristic Curves

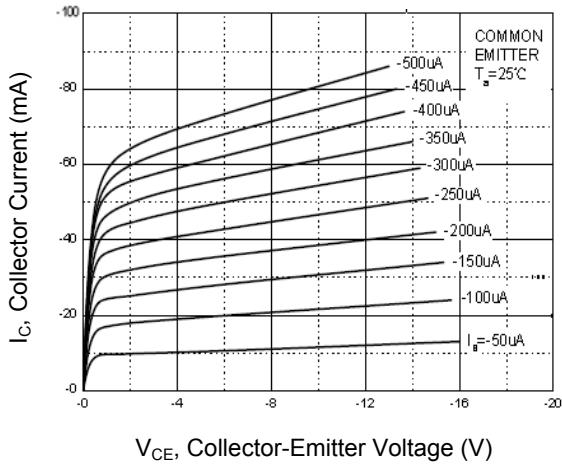


Figure 1. Static Characteristic

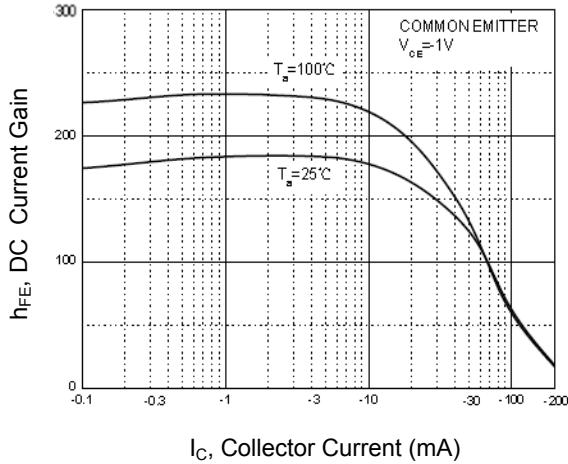


Figure 2. DC Current Gain vs. Collector Current

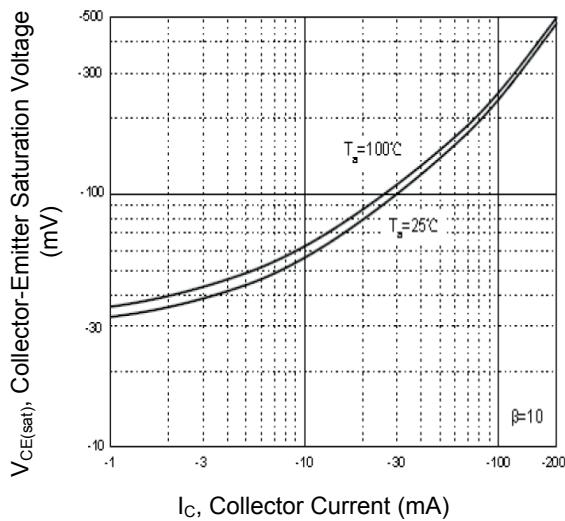


Figure 3. Collector - Emitter Saturation Voltage vs. Collector Current

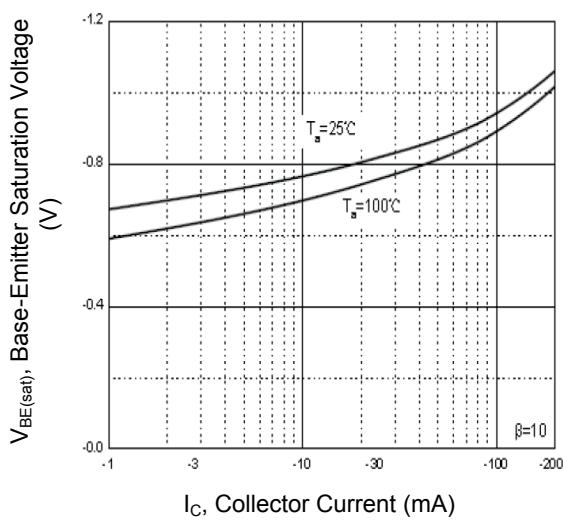


Figure 4. Base - Emitter Saturation Voltage vs. Collector Current

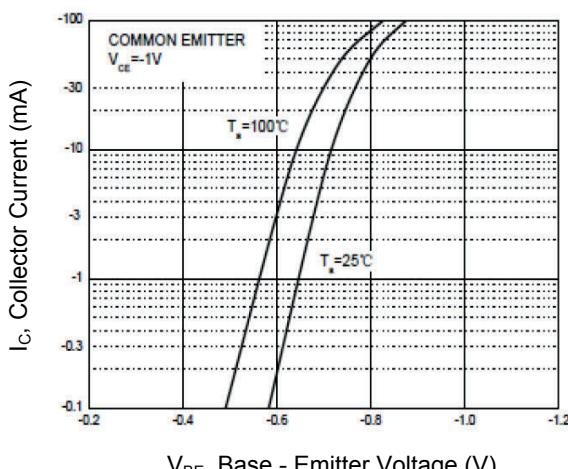


Figure 5. Collector Current vs. Base - Emitter Voltage

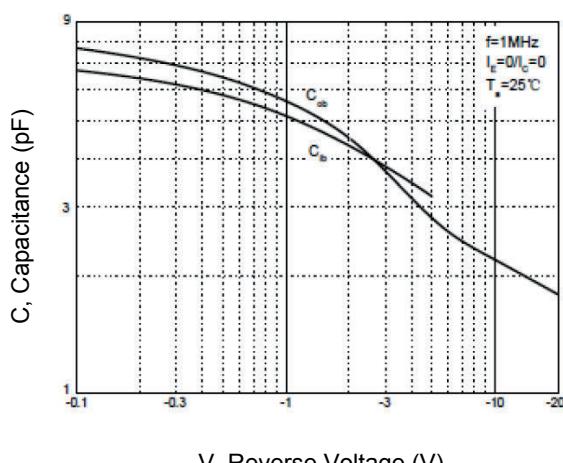


Figure 6. Capacitance Characteristics

## Ratings and Characteristic Curves

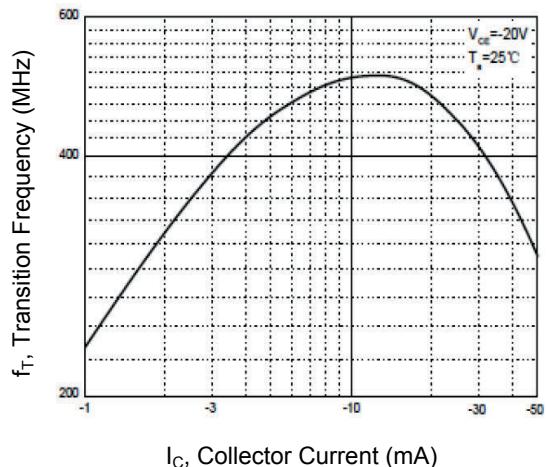


Figure 7. Transition Frequency vs. Collector Current

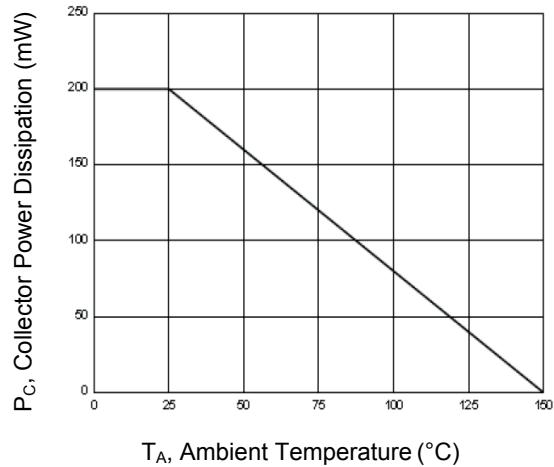
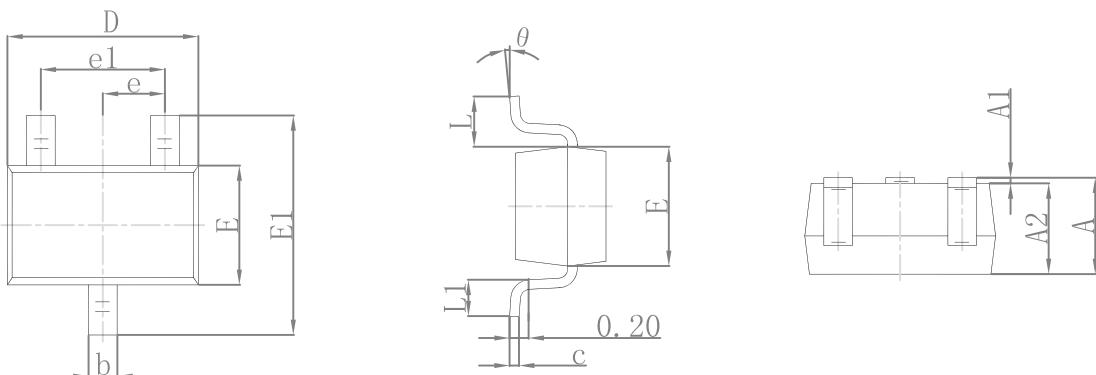


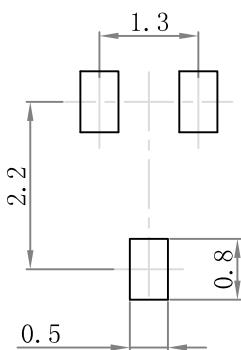
Figure 8. Power Dissipation vs. Ambient Temperature

## Package Outline Dimensions (SOT-323)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.200	0.400	0.008	0.016
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP		0.026 TYP	
e1	1.200	1.400	0.047	0.055
L	0.525 REF		0.021 REF	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

## Recommended Pad Layout



Note:

1. Controlling dimension: in millimeters
2. General tolerance:  $\pm 0.05\text{mm}$
3. The pad layout is for reference purposes only

## Order Information

Device	Package	Marking	Quantity	HSF Status
MMST3906	SOT-323	K5N	3,000pcs / Reel	RoHS Compliant