RECTRON
SEMICONDUCTOR
TECHNICAL SPECIFICATION

MMST3904

SOT-323 BIPOLAR TRANSISTORS

TRANSISTOR (NPN)

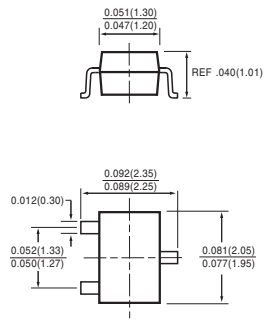
FEATURES

* Power dissipation
  Pcm: 0.2 W (Tamb=25°C)
* Collector current
  Icm: 0.2 A
* Collector-base voltage
  $V_{(BR)CBO}$: 60 V
* Operationg and storage junction temperature range
  T_J,T_{stg}: -55°Cto +150°C

MECHANICAL DATA

* Case: Molded plastic
* Epoxy: UL 94V-O rate flame retardant
* Lead: MIL-STD-202E method 208C guaranteed
* Mounting position: Any
* Weight: 0.006 gram

SOT-323



Dimensions in inches and (millimeters)

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25 °C ambient temperature unless otherwise specified.

MAXIMUM RATINGES (@ T_A = 25°C unless otherwise noted)

RATINGS	SYMBOL	VALUE	UNITS
Zener Current (see Table "Characteristics")	-	-	-
Max. Steady State Power Dissipation (1)	P_D	200	mW
Max. Operating Temperature Range	T_J	150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C

ELECTRICAL CHARACTERISTICS (@ T_A = 25°C unless otherwise noted)

CHARACTERISTICS	SYMBOL	MIN.	TYP.	MAX.	UNITS
Thermal Resistance Junction to Ambient (1)	$R_{\theta JA}$	-	-	625	°C/W
Max. Instantaneous Forward Voltage at I_F= 10mA	V_F	-	-	-	Volts

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

ELECTRICAL CHARACTERISTICS (@TA=25°C unless otherwise noted)

Chatacteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS (2)				
Collector-Emitter Breakdown Voltage (I_C= 1.0mAdc, I_B= 0)	$V_{(BR)CEO}$	40	-	Vdc
Collector-Base Breakdown Voltage (I_C= 10μAdc, I_E= 0)	$V_{(BR)CBO}$	60	-	Vdc
Emitter-Base Breakdown Voltage (I_E= 10μAdc, I_C= 0)	$V_{(BR)EBO}$	5.0	-	Vdc
Collector Cutoff Current (V_{CE}= 40Vdc,I_B=0)	I_{CEO}	-	0.1	nAdc
Collector Cutoff Current (V_{CB}= 60Vdc, I_E= 0)	I_{CBO}	-	0.1	μAdc
Emitter Cutoff Current (V_{EB}= 5Vdc, I_C= 0)	I_{EBO}	-	0.1	μAdc
Base Cutoff Current (V_{CE}= 60Vdc, $V_{EB(off)}$= 3.0Vdc	I_{BL}	-	50	nAdc
ON CHARACTERISTICS (2)				
DC Current Gain (I_C= 100μAdc, V_{CE}= 1.0Vdc)	hFE	40	-	-
(I_C= 1.0mAdc, V_{CE}= 1.0Vdc)		70	-	
(I_C= 10mAdc, V_{CE}= 1.0Vdc)		100	300	
(I_C= 50mAdc, V_{CE}= 1.0Vdc)		60	-	
(I_C= 100mAdc, V_{CE}= 1.0Vdc)		30	-	
Collector-Emitter Saturation Voltage (I_C= 10mAdc, I_B= 1.0mAdc)	$V_{CE(sat)}$	-	0.25	Vdc
(I_C= 50mAdc, I_B= 5.0mAdc)		-	0.30	
Base-Emitter Saturation Voltage (I_C= 10mAdc, I_B= 1.0mAdc)	$V_{BE(sat)}$	0.65	0.85	Vdc
(I_C= 50mAdc, I_B= 5.0mAdc)		-	0.95	
SMALL-SIGNAL CHARACTERISTICS				
Current-Gain-Bandwidth Product (3) (I_C= 10mAdc, V_{CE}= 20Vdc, f= 100MHz)	f_T	250	-	MHz
Output Capacitance (V_{CE}=0.5Vdc, I_C= 0, f= 1.0MHz)	C_{obo}	-	4.0	pF
Input Capacitance (V_{EB}=0.5Vdc, I_C= 0, f= 1.0MHz)	C_{ibo}	-	8.0	pF
Input Impedance (I_C= 1.0mAdc, V_{CE}=10Vdc, f=1.0kHz)	h_{ie}	1.0	10	kΩ
Voltage Feedback Ratio (I_C= 1.0mAdc, V_{CE}= 10Vdc, f= 1.0kHz)	h_{re}	0.5	8.0	X 10^{-4}
Small-Signal Current Gain (I_C= 1.0mAdc, V_{CE}= 10Vdc, f= 1.0kHz)	h_{fe}	100	400	-
Output Admittance (I_C= 10mAdc, V_{CE}= 10Vdc, f= 1.0kHz)	h_{oe}	1.0	40	μs
Noise Figure (I_C= 100μAdc, V_{CE}= 5.0Vdc, R_S= 1.0kΩ, f= 1.0kHz)	NF	-	5.0	dB
SWITCHING CHARACTERISTICS				
Delay Time	(V_{CC}= 3Vdc, V_{BE}= 0.5Vdc, I_C= 10mAdc, I_{B1}= 1mAdc)	t_d	-	35	ns
Rise Time		t_r	-	35	
Storage Time	(V_{CC}= 3Vdc, I_C= 10mAdc, I_{B1}= I_{B2}= 1mAdc)	t_s	-	200	ns
Fall Time		t_f	-	50	

NOTES : 2. Pulse Test: Pulse Width≤300μs,Duty Cycle≤2.0%