DATA SHEET (Preliminary)

MMDT5451

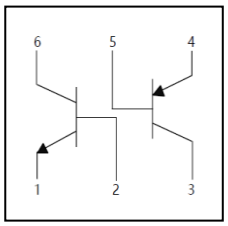
◇Epoxy Meets UL 94 V-0 Flammability Rating

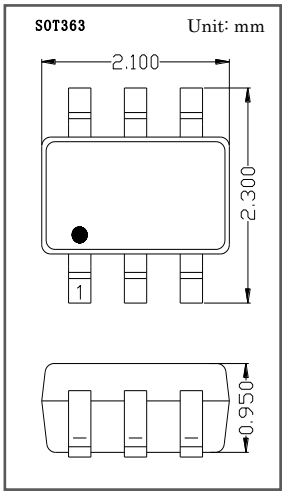
◇Lead Free Finish/RoHS Compliant

◇For Switching and AF Amplifier Applications

◇Rugged And Reliable

Equivalent Circuit





Device Marking Code	
MMDT5451	KNM

Maximum Ratings @25 ℃ Unless Otherwise Specified

NPN Transistor

Symbol	Parameter	Value	Units
V_{CBO}	Collector-Base Voltage	180	V
V_{CEO}	Collector-Emitter Voltage	160	V
V_{EBO}	Emitter-Base Voltage	6	V
P_D	Power Dissipation	200	mW
I_C	Collector Current	200	mA
T_J	Junction Temperature	-55 to 150	℃
$T_{STG,}$	Storage Temperature	-55 to 150	℃
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	625	℃/W

PNP Transistor

Symbol	Parameter	Value	Units
V_{CBO}	Collector-Base Voltage	-160	V
V_{CEO}	Collector-Emitter Voltage	-150	V
V_{EBO}	Emitter-Base Voltage	-5	V
P_D	Power Dissipation	200	mW
I_C	Collector Current	-200	mA
T_J	Junction Temperature	-55 to 150	℃
$T_{STG,}$	Storage Temperature	-55 to 150	℃
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	625	℃/W

Electrical Characteristics @Ta = 25 ℃ Unless Otherwise Specified

NPN Transistor

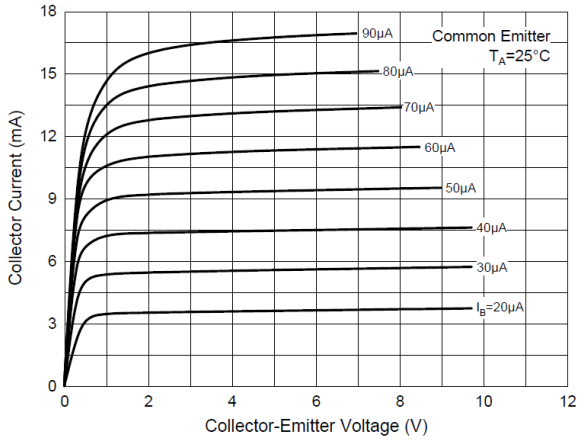
Symbol	Parameter	Test conditions	Min	Typ	Max	Unit
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	Ic=100μA,I_E=0	180			V
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	Ic=1mA,I_B=0	160			V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	I_E=10μA,I_C=0	6			V
I_{CBO}	Collector Cut-Off Current	V_{CB}=120V,I_E=0			50	nA
I_{EBO}	Emitter Cutoff Current	V_{EB} =4V, I_C=0			50	nA
h_{FE}	DC Current Gain	V_{CE}=5V,I_C=1mA	80			
		V_{CE}=5V,I_C=10mA	100		300	
		V_{CE}=5V,I_C=50mA	30			
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C=10mA,I_B=1mA			0.15	V
		I_C=50mA,I_B=5mA			0.20	
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	I_C=10mA,I_B=1mA			1.0	V
		I_C=500mA,I_B=5mA			1.0	
f_T	Transition Frequency	V_{CE}=10V, I_C=10mA, f=100MHz	100		300	MHz
C_{obo}	Output Capacitance	V_{CB}=10V, I_E=0, f=1MHz			6	pF
N_F	Noise Figure	V_{CE}=5V, I_C=0.2mA, f=1KHz Rs=1KΩ,			8	dB

PNP Transistor

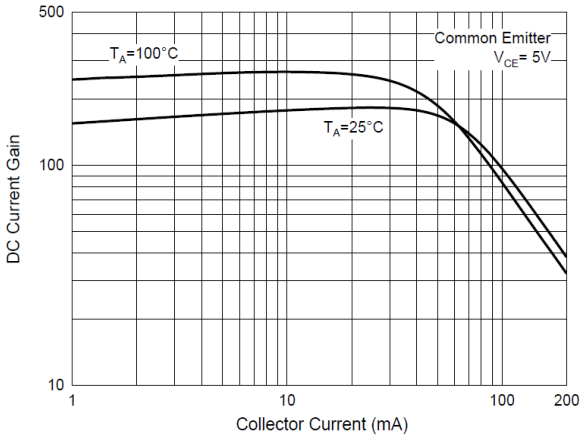
Symbol	Parameter	Test conditions	Min	Typ	Max	Unit
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	Ic=-100μA,I_E=0	-160			V
$V_{(BR)CEO}$	Collector-Emitter Breakdown	Ic=-1mA,I_B=0	-150			V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	I_E=-10μA,I_C=0	-5			V
I_{CBO}	Collector Cut-Off Current	V_{CB}=-120V,I_E=0			-50	nA
I_{EBO}	Emitter Cutoff Current	V_{EB} =-3V, I_C=0			-50	nA
h_{FE}	DC Current Gain	V_{CE}=-5V,I_C=-1mA	50			
		V_{CE}=-5V,I_C=-10mA	100		300	
		V_{CE}=-5V,I_C=-50mA	50			
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C=-10mA,I_B=-1mA			-0.20	V
		I_C=-50mA,I_B=-5mA			-0.50	
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	I_C=-10mA,I_B=-1mA			-1.0	V
		I_C=-50mA,I_B=-5mA			-1.0	
f_T	Transition Frequency	V_{CE}=-10V,I_C=-10mA, f=100MHz	100		300	MHz
C_{obo}	Output Capacitance	V_{CB}=-10V, I_E=0, f=1MHz			6	pF
N_F	Noise Figure	V_{CE}=-5V, I_C=-0.2mA, f=1KHz Rs=10Ω,			8	dB

Typical Characteristics

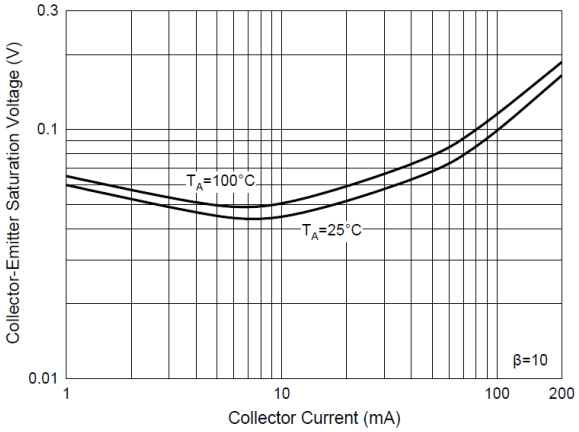
Curve Characteristics (NPN)



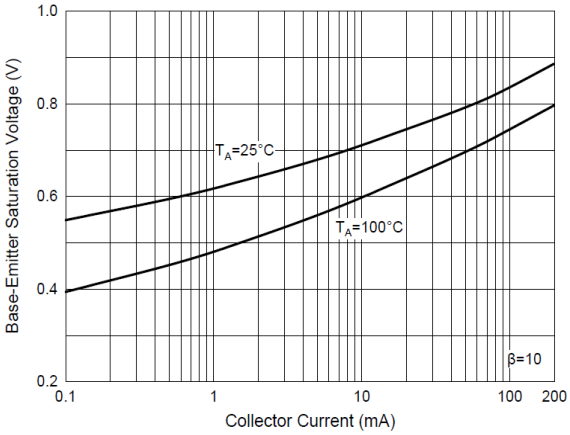
Static Characteristics



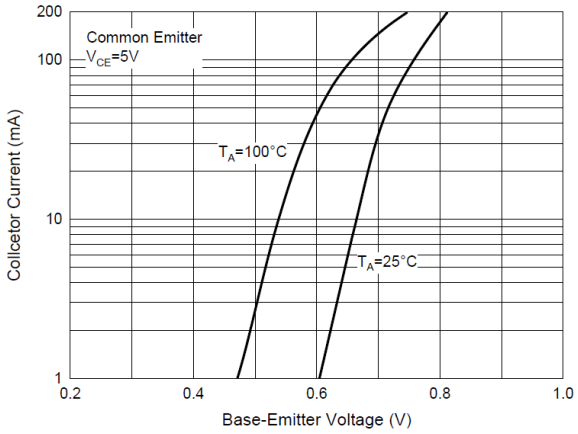
DC Current Gain Characteristics



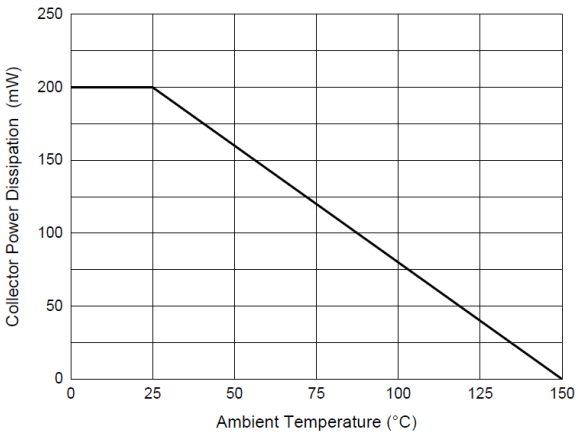
Collector-Emitter Saturation Voltage Characteristics



Base-Emitter Saturation Voltage Characteristics

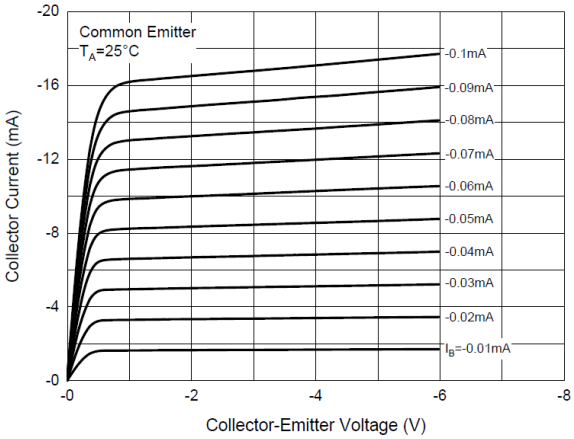


Base-Emitter Voltage Characteristics

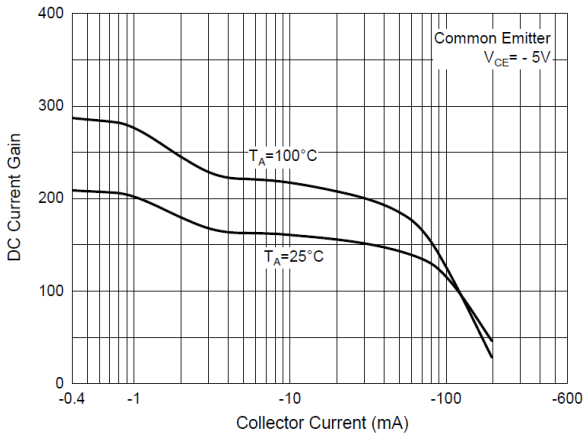


Collector Power Derating Curve

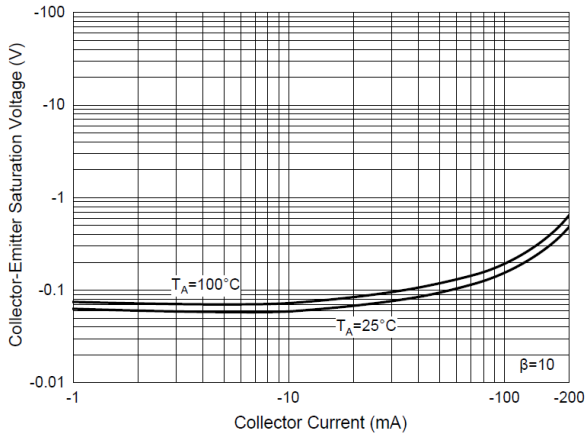
Curve Characteristics (PNP)



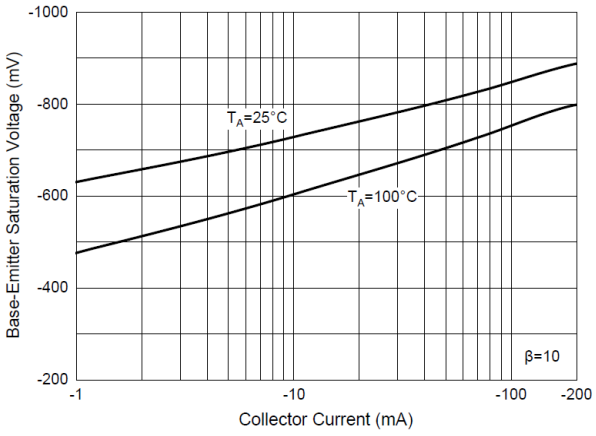
Static Characteristics



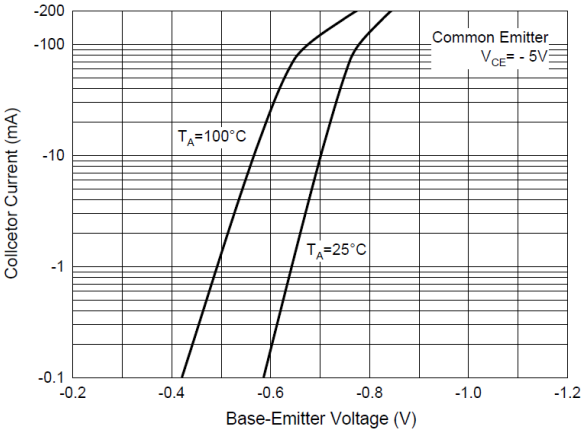
DC Current Gain Characteristics



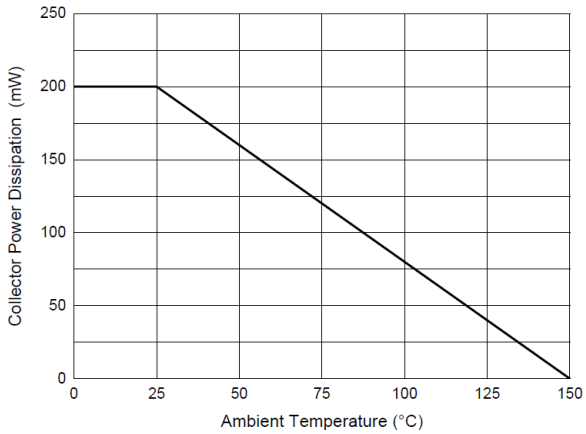
Collector-Emitter Saturation Voltage Characteristics



Base-Emitter Saturation Voltage Characteristics



Base-Emitter Voltage Characteristics

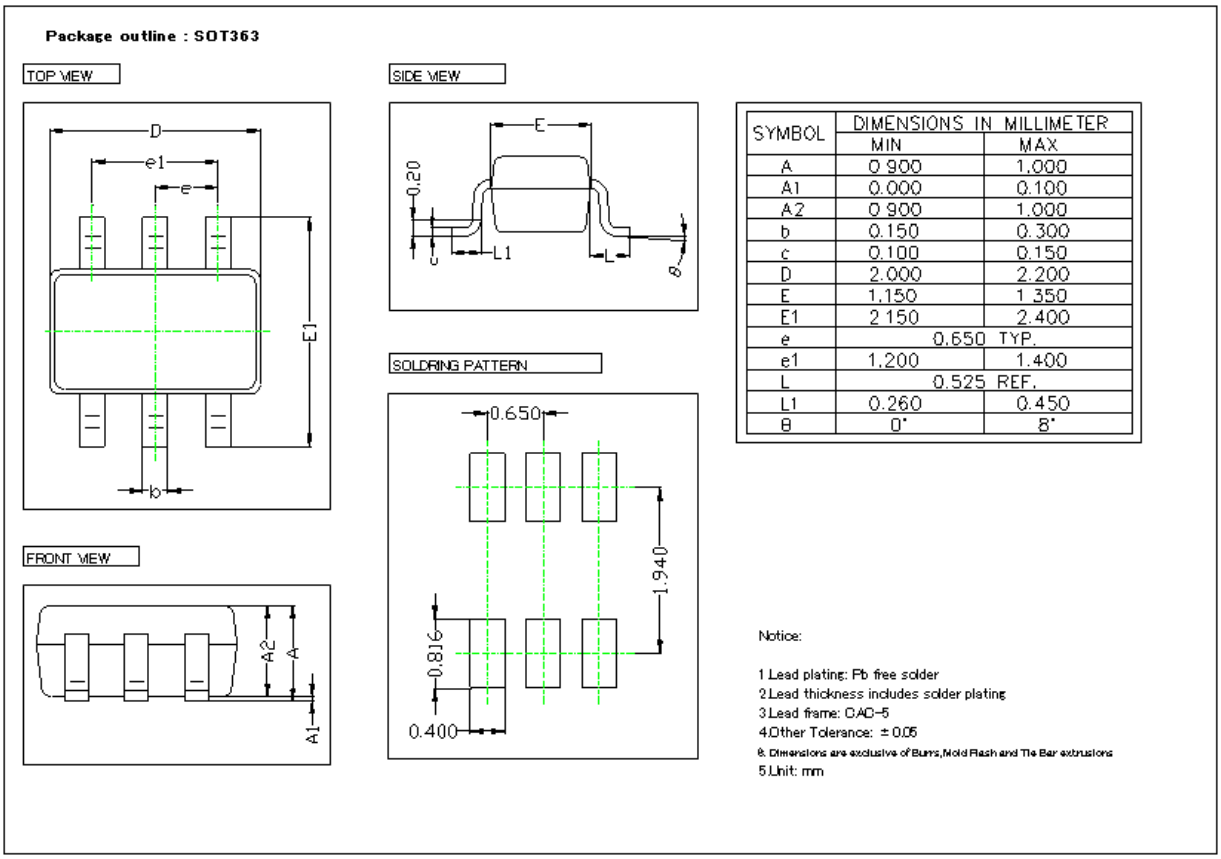


Collector Power Derating Curve

Ordering Information

Device	Package	Shipping	Tape wide	Emboss pitch	Tape specification	Notes
MMDT5451	SOT363	Tape & Reel 3000pcs /7" Reel	8mm	4mm	Conductive	

Package Dimensions



SYMBOL	DIMENSIONS IN MILLIMETER	
	MIN	MAX
A	0.900	1.000
A1	0.000	0.100
A2	0.900	1.000
b	0.150	0.300
c	0.100	0.150
D	2.000	2.200
E	1.150	1.350
E1	2.150	2.400
e	0.650 TYP.	
e1	1.200	1.400
L	0.525 REF.	
L1	0.260	0.450
θ	0°	8°

Notice:

1.Lead plating: Pb free solder
2.Lead thickness includes solder plating
3.Lead frame: C.A.C-5
4.Other Tolerance: ±0.05
6. Dimensions are exclusive of Burrs,Mold Flash and Tie Bar extrusions
5.Unit: mm

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