

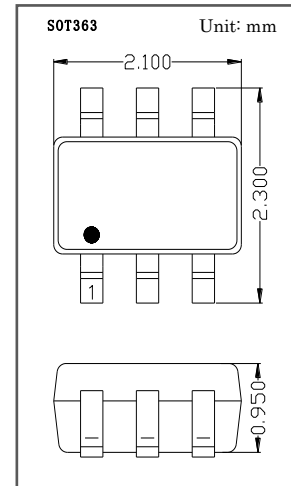
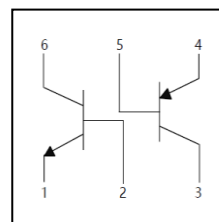
DATA SHEET (Preliminary)

MMDT5451

- ◇Epoxy Meets UL 94 V-0 Flammability Rating
- ◇Lead Free Finish/RoHS Compliant
- ◇For Switching and AF Amplifier Applications
- ◇Rugged And Reliable

Device Marking Code	
MMDT5451	KNM

Equivalent Circuit



Maximum Ratings @25 °C 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	°C
T_{STG}	Storage Temperature	-55 to 150	°C
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	625	°C/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	°C
T_{STG}	Storage Temperature	-55 to 150	°C
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	625	°C/W

Electrical Characteristics @Ta = 25 °C Unless Otherwise Specified

NPN Transistor

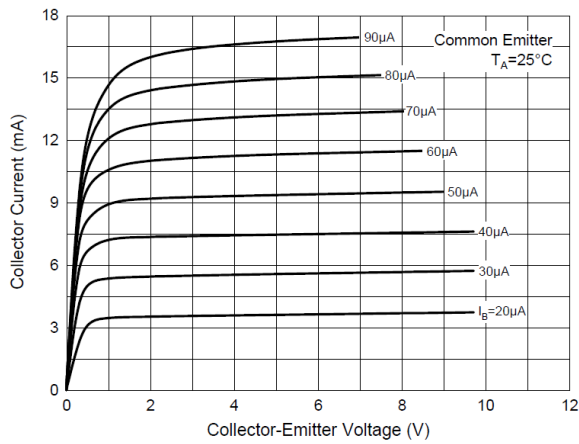
Symbol	Parameter	Test conditions	Min	Typ	Max	Unit
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C=100\mu A, I_E=0$	180			V
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	$I_C=1mA, I_E=0$	160			V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E=10\mu A, I_C=0$	6			V
I_{CBO}	Collector Cut-Off Current	$V_{CB}=120V, I_E=0$			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	$V_{CE}=5V, I_C=0.2mA,$ $f=1KHz, R_S=1K\Omega,$			8	dB

PNP Transistor

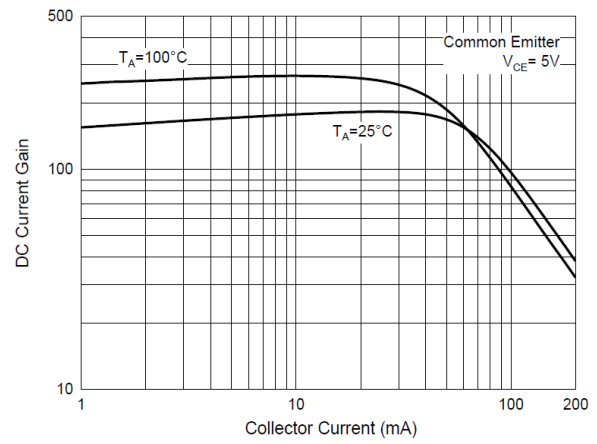
Symbol	Parameter	Test conditions	Min	Typ	Max	Unit
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C=-100\mu A, I_E=0$	-160			V
$V_{(BR)CEO}$	Collector-Emitter Breakdown	$I_C=-1mA, I_B=0$	-150			V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E=-10\mu A, I_C=0$	-5			V
I_{CBO}	Collector Cut-Off Current	$V_{CB}=-120V, I_E=0$			-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	$V_{CE}=-5V, I_C=-0.2mA,$ $f=1KHz R_s=10\Omega,$			8	dB

Typical Characteristics

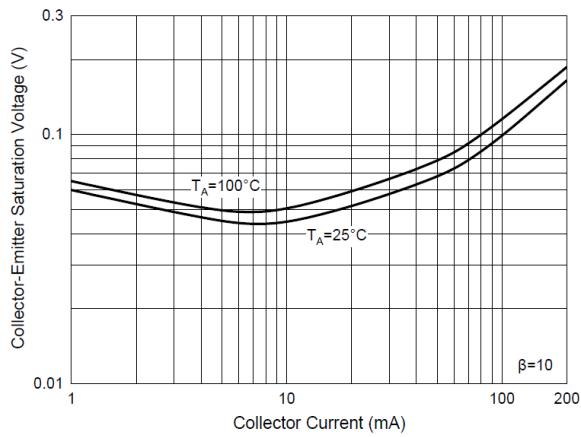
Curve Characteristics (NPN)



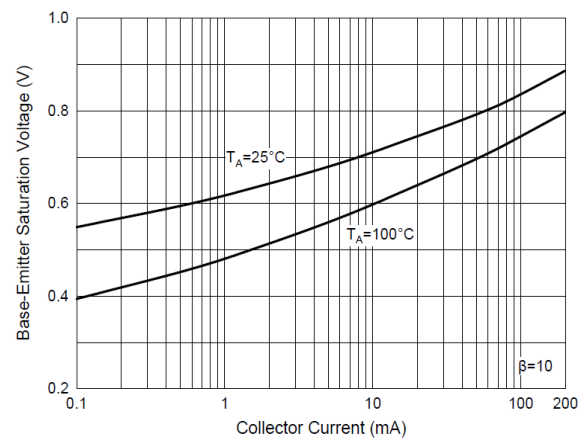
Static Characteristics



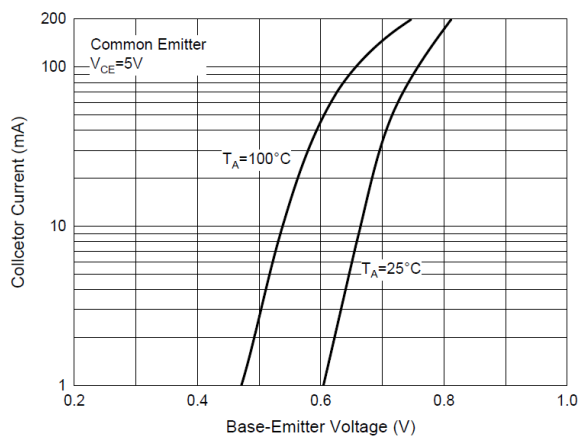
DC Current Gain Characteristics



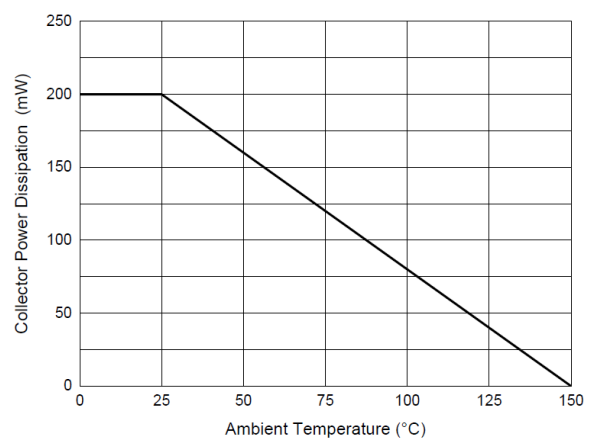
Collector-Emitter Saturation Voltage Characteristics



Base-Emitter Saturation Voltage Characteristics

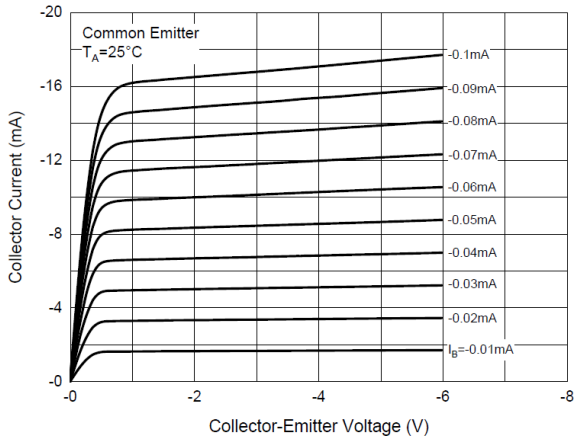


Base-Emitter Voltage Characteristics

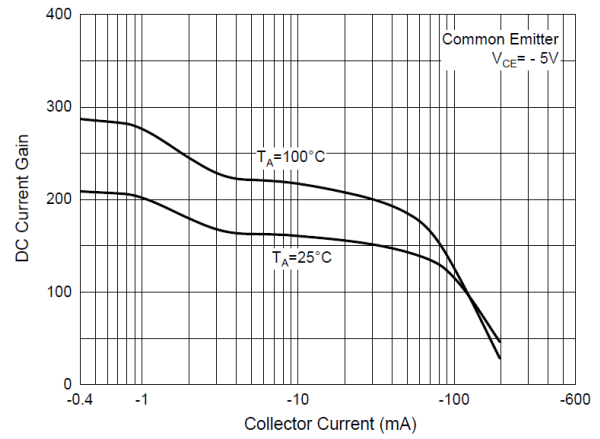


Collector Power Derating Curve

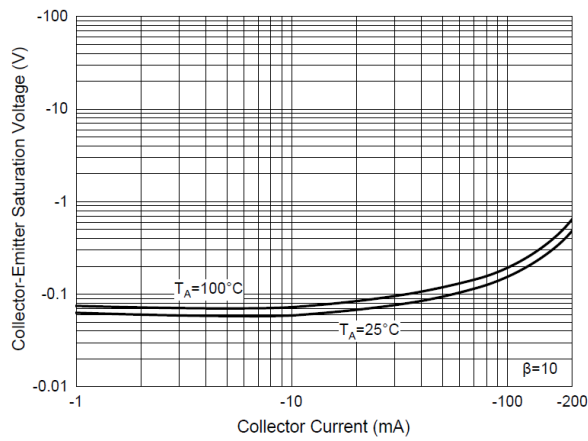
Curve Characteristics (PNP)



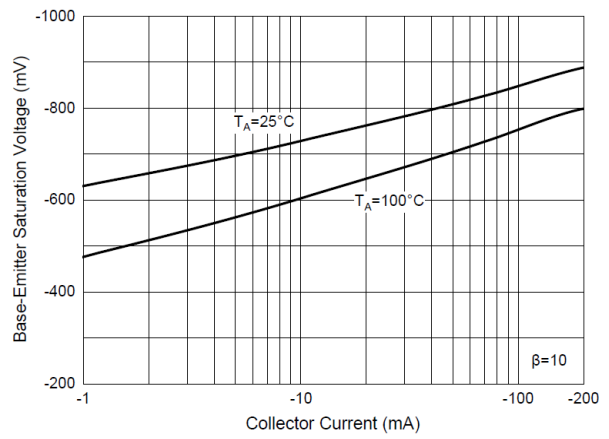
Static Characteristics



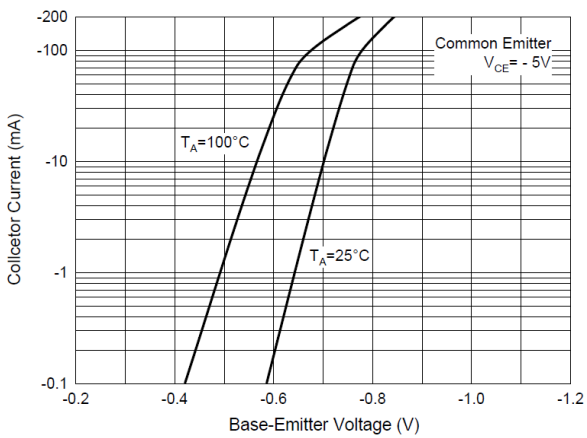
DC Current Gain Characteristics



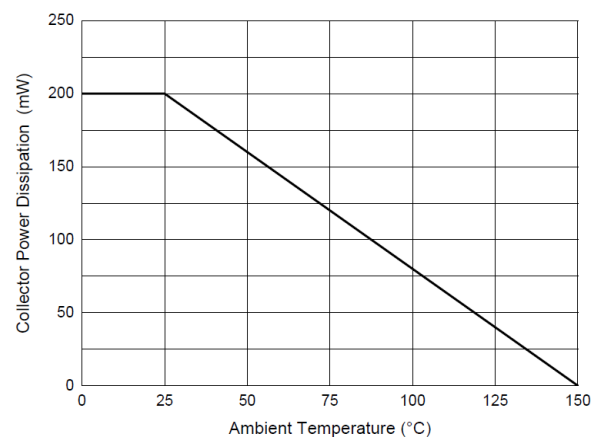
Collector-Emmitter Saturation Voltage Characteristics



Base-Emmitter Saturation Voltage Characteristics



Base-Emmitter Voltage Characteristics



Collector Power Derating Curve

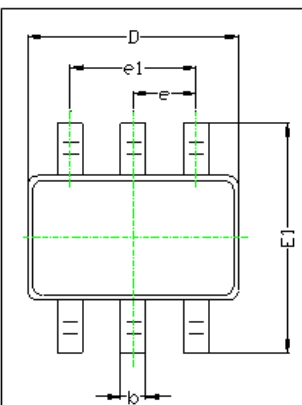
Ordering Information

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

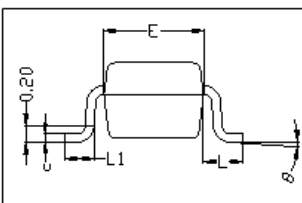
Package Dimensions

Package outline : SOT363

TOP VIEW




SIDE VIEW

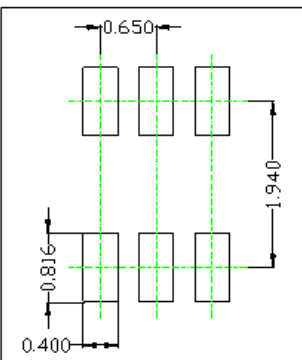


SYMBOL	DIMENSIONS IN MILLIMETER	
	MIN	MAX
A	0.900	1.000
A1	0.000	0.100
A2	0.900	1.000
b	0.150	0.300
c	0.100	0.150
D	2.000	2.200
E	1.150	1.350
E1	2.150	2.400
e	0.650 TYP.	
e1	1.200	1.400
L	0.525 REF.	
L1	0.260	0.450
Ø	0*	8*

FRONT VIEW



SOLDERING PATTERN



Notice:

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