

MMDT2222A

Rev.C Oct.-2021

/ Descriptions

SOT-363 NPN Double silicon NPN transistor in a SOT-363 Plastic Package.

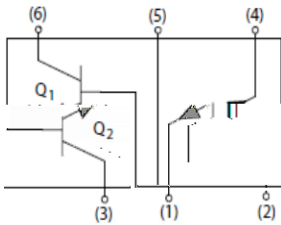
/ Features

600mA
Collector currents up to 600 mA. HF Product.

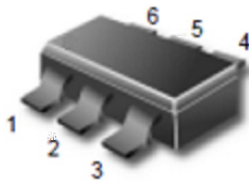
/ Applications

General purpose amplifier.

/ Equivalent Circuit



/ Pinning



PIN 1 4 Emitter PIN 2 5 Base PIN 3 6 Collector

/ h_{FE} Classifications & Marking

See Marking Instructions.

/ Absolute Maximum Ratings(Ta=25)

Parameter	Symbol	Rating	Unit
Collector to Base Voltage	V_{CBO}	75	V
Collector to Emitter Voltage	V_{CEO}	40	V
Emitter to Base Voltage	V_{EBO}	6.0	V
Collector Current	I_C	600	mA
Total Package Dissipation ^{Note1}	P_D	150	mW
Junction Temperature	T_J	-55 +150	
Storage Temperature Range	T_{stg}	-55 +150	

Note1 Device mounted on FR4 glass epoxy printed circuit board using the minimum recommended footprint.

/ Electrical Characteristics(Ta=25)

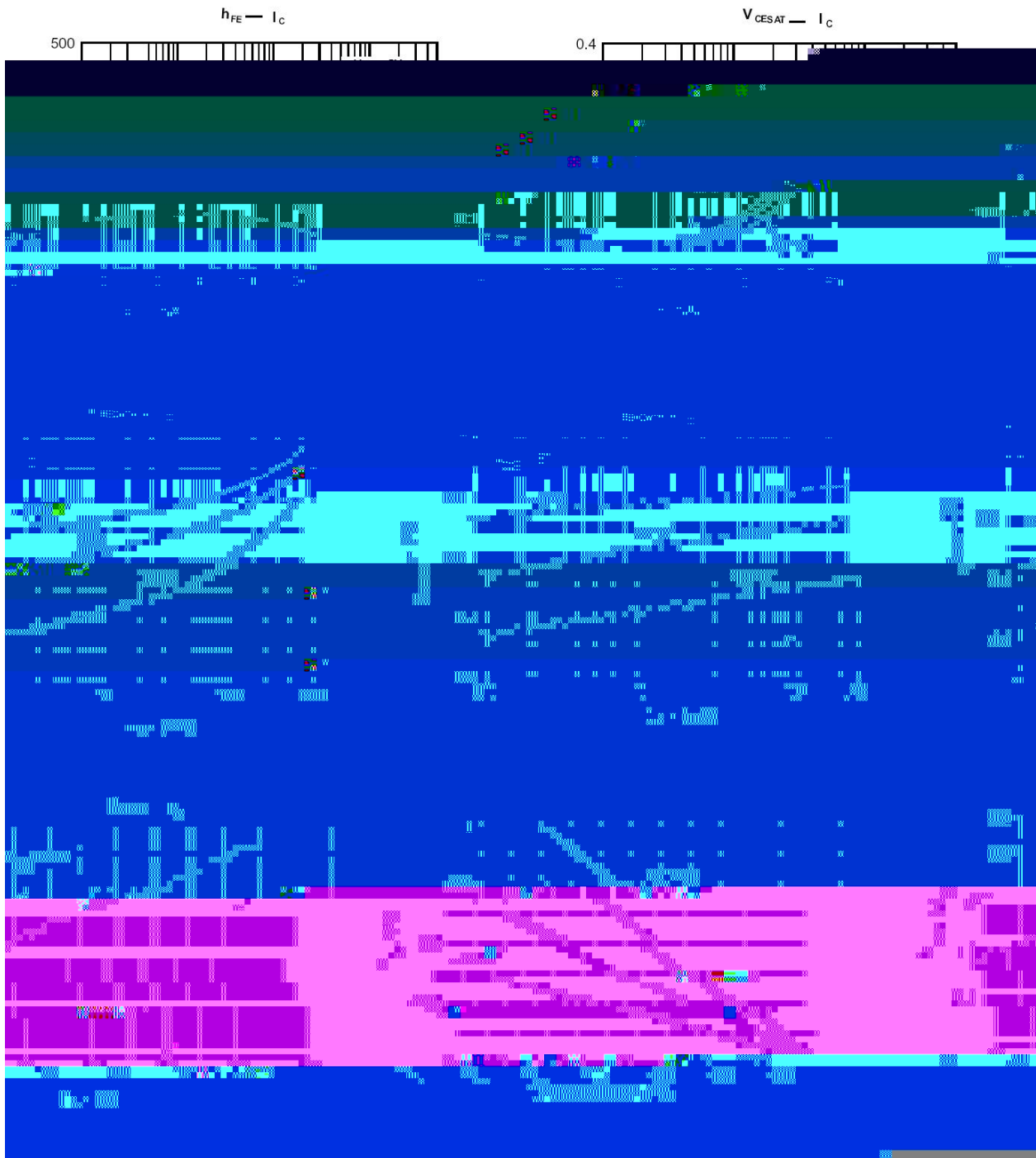
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector Base Breakdown Voltage	V_{CBO}	$I_C = 10\mu A$ $I_E = 0$	75			V
Collector Emitter Breakdown Voltage	V_{CEO}	$I_C = 10mA$ $I_B = 0$	40			V
Emitter Base Breakdown Voltage	V_{EBO}	$I_E = 10\mu A$ $I_C = 0$	6.0			V
Collector Cut-Off Current	I_{CEX}	$V_{CE} = 60V$ $V_{EB(off)} = 3V$			10	nA
Collector Cut-Off Current	I_{CBO}	$V_{CB} = 60V$ $I_E = 0$			0.01	A
		$V_{CB} = 60V$ $I_E = 0$ $T_A = 125$			10	A
Emitter Cut-Off Current	I_{EBO}	$V_{EB} = 3.0V$ $I_C = 0$			100	nA
Base Cut-Off Current	I_{BL}	$V_{CE} = 60V$ $V_{EB(off)} = 3V$			20	nA
DC Current Gain	$h_{FE(1)}$	$V_{CE} = 10V$ $I_C = 0.1mA$	35			
	$h_{FE(2)}$	$V_{CE} = 10V$ $I_C = 1.0mA$	50			
	$h_{FE(3)}$	$V_{CE} = 10V$ $I_C = 10mA$	75			
	$h_{FE(4)}$	$V_{CE} = 10V$ $I_C = 10mA$ $T_A = -55$	35			
	$h_{FE(5)}$	$V_{CE} = 10V$ $I_C = 150mA$ (Note 2)	100		300	
	$h_{FE(6)}$	$V_{CE} = 1.0V$ $I_C = 150mA$ (Note 2)	50			
	$h_{FE(7)}$	$V_{CE} = 10V$ $I_C = 500mA$ (Note 2)	40			

/ Electrical Characteristics(Ta=25)

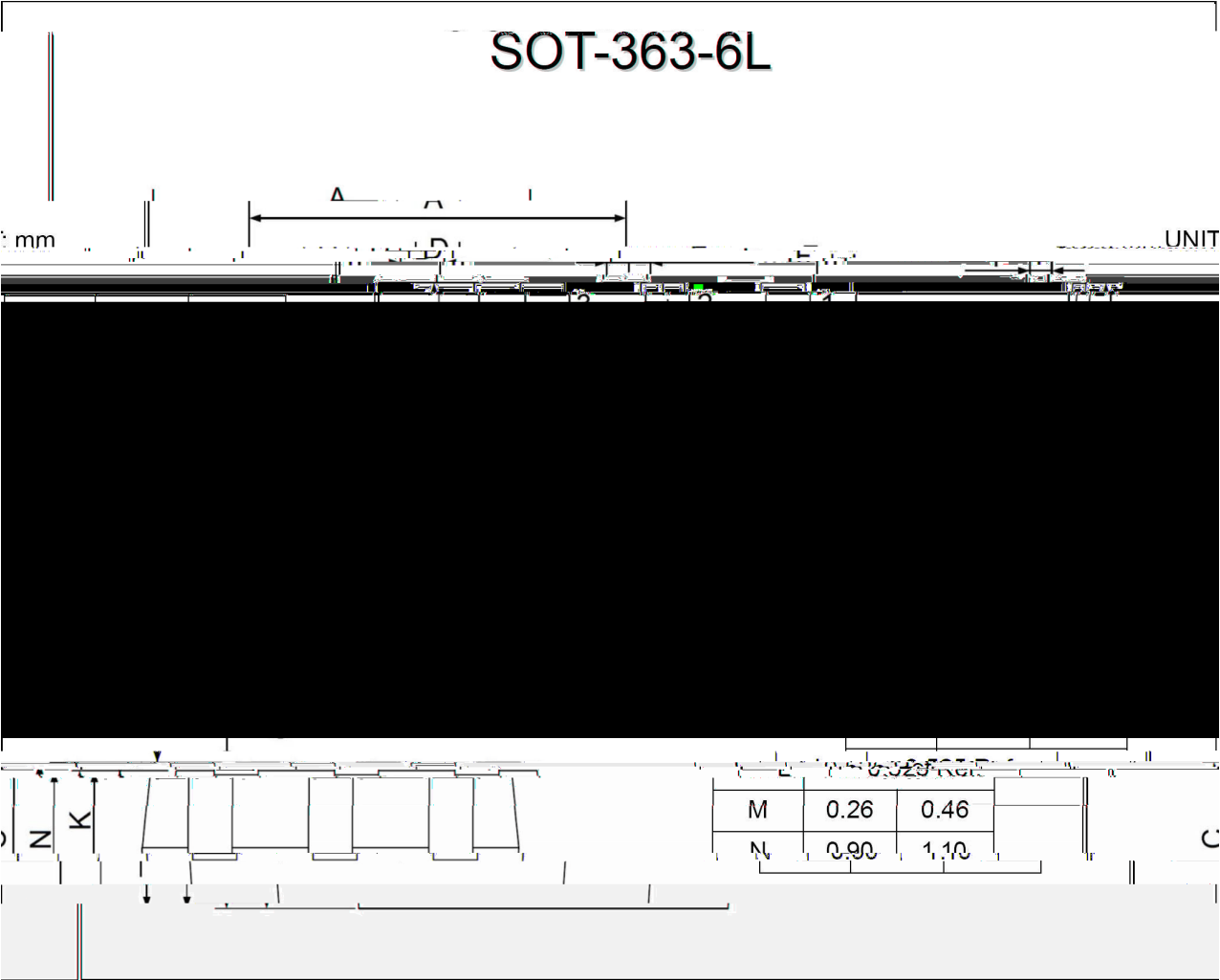
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector-Emitter Saturation Voltage	$V_{CE(sat)} (1)$	$I_C=150mA$ $I_B=15mA$			0.3	V
	$V_{CE(sat)} (2)$	$I_C=500mA$ $I_B=50mA$			1.0	V
Base-Emitter Saturation Voltage	$V_{BE(sat)} (1)$	$I_C=150mA$ $I_B=15mA$	0.6		1.2	V
	$V_{BE(sat)} (2)$	$I_C=500mA$ $I_B=50mA$			2.0	V
Transition Frequency(Note 3)	f_T	$V_{CE}=20V$ $I_C=20mA$ $f=100MHz$	300			MHz
Output Capacitance	C_{ob}	$V_{CB}=10V$ $I_E=0$ $f=1.0MHz$			8.0	pF
Input Capacitance	C_{ib}	$V_{EB}=0.5V$ $I_C=0$ $f=1.0MHz$			25	
Input Impedance	h_{ie}	$I_C=1.0mA$ $V_{CE}=10V$ $f=1.0kHz$	2.0		8.0	k Ω
		$I_C=10mA$ $V_{CE}=10V$ $f=1.0kHz$	0.25		1.25	
Voltage Feedback Ratio	h_{re}	$I_C=1.0mA$ $V_{CE}=10V$ $f=1.0kHz$			8.0	$\times 10^{-4}$
		$I_C=10mA$ $V_{CE}=10V$ $f=1.0kHz$			4.0	
Small Signal Current Gain	h_{fe}	$I_C=1.0mA$ $V_{CE}=10V$ $f=1.0kHz$	50		300	-
		$I_C=10mA$ $V_{CE}=10V$ $f=1.0kHz$	75		375	-
Output Admittance	h_{oe}	$I_C=1.0Ma$ $V_{CE}=10V$ $f=1.0kHz$	5.0		35	$\mu mhos$
		$I_C=10mA$ $V_{CE}=10V$ $f=1.0kHz$	25		200	
Collector Base Time Constant	r_b, C_c	$I_E=20mA$ $V_{CB}=20V$ $f=31.8MHz$			150	Ps
Noise Figure	NF	$I_C=100\mu A$ $V_{CE}=10V$ $R_S=1.0k\Omega$ $f=1.0 kHz$			4.0	dB
Turn-on Time	t_d	$V_{CC}=30V$ $I_C=150mA$ $V_{BE(OFF)}=-0.5V$			10	ns
Storage Time	t_r	$I_{B1}=15mA$			25	ns
	t_s	$V_{CC}=30V$ $I_C=150mA$			225	ns
Fall Time	t_f	$I_{B1}=I_{B2}=15mA$			60	ns

Note2 . Pulse Test: Pulse Width 300 μs , Duty Cycle 2.0%.Note3: f_T is defined as the frequency at which $|h_{fe}|$ extrapolates to unity.

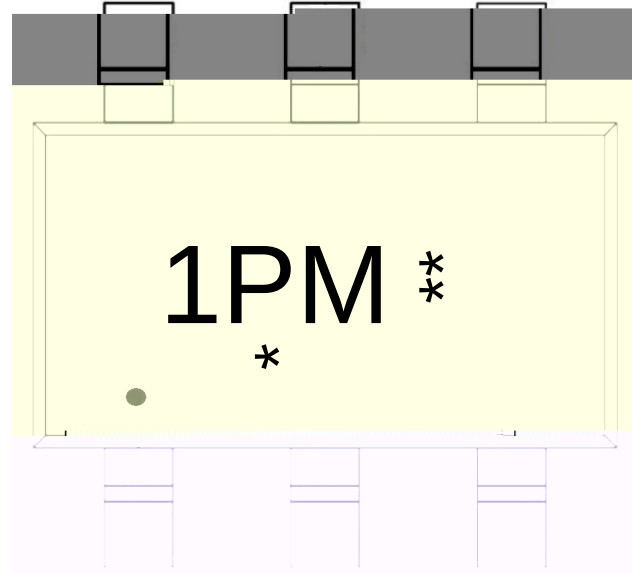
/ Electrical Characteristic Curve



/ Package Dimensions



/ Marking Instructions



● “ 1 ”

1PM

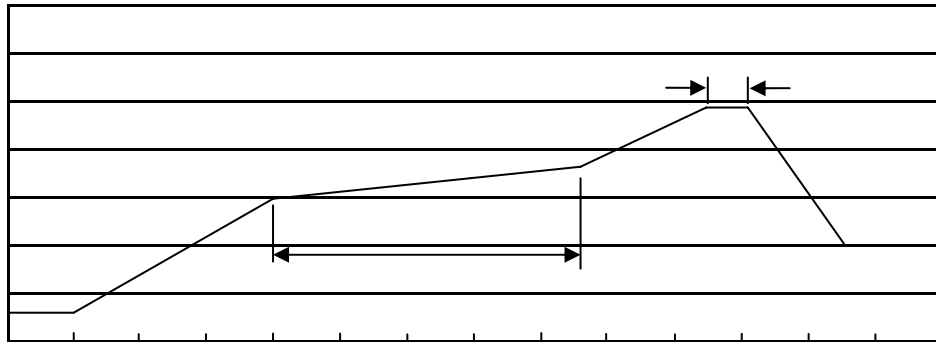
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Note:

● “ 1 ” Pin

1PM Product Type Code

***: Lot No. Code, code change with Lot No.

() / Temperature Profile for IR Reflow Soldering(Pb-Free)


Note:

- | | | | |
|---|---------|-----------|---|
| 1 | 150 180 | 60 90sec; | 1.Preheating:150~180 , Time:60~90sec. |
| 2 | 245±5 | 5±0.5sec; | 2.Peak Temp.:245±5 , Duration:5±0.5sec. |
| 3 | 2 10 | /sec. | 3. Cooling Speed: 2~10 /sec. |

/ Resistance to Soldering Heat Test Conditions

260±5 10±1 sec. Temp.:260±5 Time:10±1 sec

/ Packaging SPEC.

/ REEL

Package Type 封装形式	Units 包装数量					Dimension 包装尺寸 (unit: mm ³)		
	Units/Reel 只/卷盘	Reels/Inner Box 卷盘/盒	Units/Inner Box 只/盒	Inner Boxes/Outer Box 盒/箱	Units/Outer Box 只/箱	Reel	Inner Box 盒	Outer Box 箱
SOT-363	3,000	10	30,000	6	180000	7 ×8	180×120×180	390×385×205

/ Notices