



## MMDT2222A

DUAL TRANSISTOR

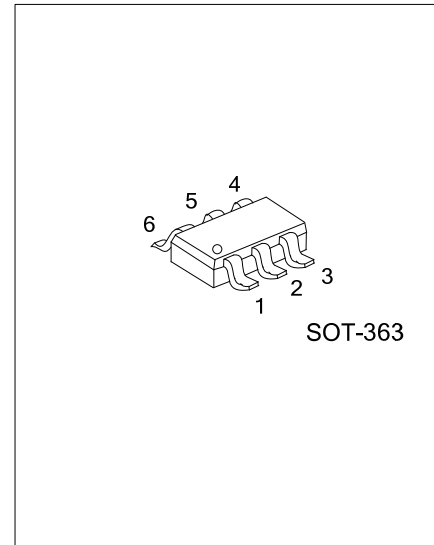
### DUAL NPN SMALL SIGNAL SURFACE MOUNT TRANSISTOR

#### DESCRIPTION

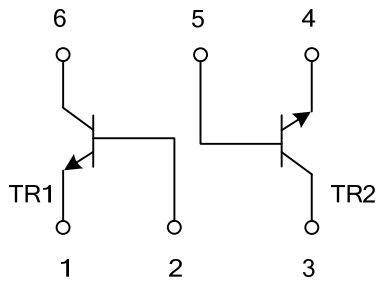
The UTC **MMDT2222A** is a Dual NPN small signal surface mount transistor. It's suitable for low power amplification and switch.

#### FEATURES

- \* Suitable for Low Power Amplification and Switching
- \* Epitaxial Planar Die Construction
- \* Extremely-Small Surface Mount Package



#### EQUIVALENT CIRCUIT



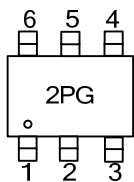
#### ORDERING INFORMATION

Ordering Number	Package	Pin Assignment						Packing
		1	2	3	4	5	6	
MMDT2222AG-AL6-R	SOT-363	E1	B1	C2	C1	B2	E2	Tape Reel

Note: Pin Assignment: E: Emitter    B: Base    C: Collector

MMDT2222AG-AL6-R	(1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel (2) AL6: SOT-363 (3) G: Halogen Free and Lead Free
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#### MARKING



■ ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub>=25°C, unless otherwise specified.)

PARAMETER	SYMBOL	RATINGS	UNIT
Collector-Base Voltage	V <sub>CBO</sub>	75	V
Collector-Emitter Voltage	V <sub>CEO</sub>	40	V
Emitter-Base Voltage	V <sub>EBO</sub>	6.0	V
Collector Current-Continuous	I <sub>C</sub>	600	mA
Power Dissipation (Note 2)	P <sub>D</sub>	200	mW
Junction Temperature	T <sub>J</sub>	+150	°C
Storage Temperature	T <sub>STG</sub>	-55~+150	°C

Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

2. Maximum combined dissipation.

■ THERMAL DATA (T<sub>A</sub>=25°C, unless otherwise specified.)

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ <sub>JA</sub>	625	°C/W

■ ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C, unless otherwise specified.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS (Note)</b>						
Collector-Base Breakdown Voltage	V <sub>(BR)CBO</sub>	I <sub>C</sub> =10μA, I <sub>E</sub> =0	75			V
Collector-Emitter Breakdown Voltage	V <sub>(BR)CEO</sub>	I <sub>C</sub> =10mA, I <sub>B</sub> =0	40			V
Emitter-Base Breakdown Voltage	V <sub>(BR)EBO</sub>	I <sub>E</sub> =10μA, I <sub>C</sub> =0	6.0			V
Collector-Current	I <sub>CBO</sub>	V <sub>CB</sub> =60V, I <sub>E</sub> =0			10	nA
		V <sub>CB</sub> =60V, I <sub>E</sub> =0, T <sub>A</sub> =150°C			10	μA
Collector- Current	I <sub>CEX</sub>	V <sub>CE</sub> =60V, V <sub>EB(OFF)</sub> =3.0V			10	nA
Emitter- Current	I <sub>EBO</sub>	V <sub>EB</sub> =3.0V, I <sub>C</sub> =0			10	nA
Base- Current	I <sub>BL</sub>	V <sub>CE</sub> =60V, V <sub>EB(OFF)</sub> =3.0V			20	nA
<b>ON CHARACTERISTICS (Note)</b>						
DC Current Gain	h <sub>FE</sub>	I <sub>C</sub> =100μA, V <sub>CE</sub> =10V	35			
		I <sub>C</sub> =1.0mA, V <sub>CE</sub> =10V	50			
		I <sub>C</sub> =10mA, V <sub>CE</sub> =10V	75			
		I <sub>C</sub> =150mA, V <sub>CE</sub> =10V	100		300	
		I <sub>C</sub> =500mA, V <sub>CE</sub> =10V	40			
		I <sub>C</sub> =10mA, V <sub>CE</sub> =10V, T <sub>A</sub> =-55°C	50			
		I <sub>C</sub> =150mA, V <sub>CE</sub> =1.0V	35			
Collector-Emitter Saturation Voltage	V <sub>CE(SAT)</sub>	I <sub>C</sub> =150mA, I <sub>B</sub> =15mA			0.3	V
		I <sub>C</sub> =500mA, I <sub>B</sub> =50mA			1.0	V
Base-Emitter Saturation Voltage	V <sub>BE(SAT)</sub>	I <sub>C</sub> =150mA, I <sub>B</sub> =15mA	0.6		1.2	V
		I <sub>C</sub> =500mA, I <sub>B</sub> =50mA			2.0	V
<b>SMALL SIGNAL CHARACTERISTICS</b>						
Output Capacitance	C <sub>OBO</sub>	V <sub>CB</sub> =10V, f=1.0MHz, I <sub>E</sub> =0			8	pF
Input Capacitance	C <sub>IBO</sub>	V <sub>EB</sub> =0.5V, f=1.0MHz, I <sub>C</sub> =0			25	pF
Current Gain-Bandwidth Product	f <sub>T</sub>	V <sub>CE</sub> =20V, I <sub>C</sub> =20mA, f=100MHz	300			MHz
Noise Figure	NF	V <sub>CE</sub> =10V, I <sub>C</sub> =100μA, R <sub>S</sub> =1.0kΩ, f=1.0kHz			4.0	dB
<b>SWITCHING CHARACTERISTICS</b>						
Delay Time	t <sub>D</sub>	V <sub>CC</sub> =30V, I <sub>C</sub> =150mA, V <sub>BE(OFF)</sub> =-0.5V, I <sub>B1</sub> =15mA			10	ns
Rise Time	t <sub>R</sub>				25	ns
Storage Time	t <sub>S</sub>	V <sub>CC</sub> =30V, I <sub>C</sub> =150mA, I <sub>B1</sub> =I <sub>B2</sub> =15mA			225	ns
Fall Time	t <sub>F</sub>				60	ns

Note: Short duration pulse test used to minimize self-heating effect.

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