



MMDT3904

NPN EPITAXIAL SILICON TRANSISTOR

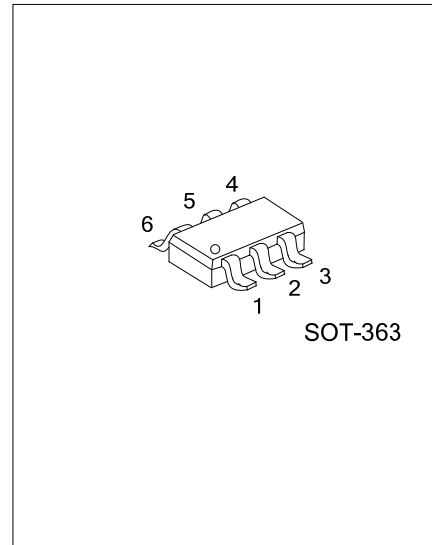
DUAL NPN SMALL SIGNAL SURFACE MOUNT TRANSISTOR

DESCRIPTION

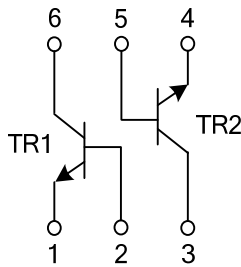
The UTC **MMDT3904** is a dual NPN small signal surface mount transistor.

FEATURES

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



EQUIVALENT CIRCUIT

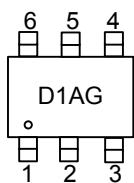


ORDERING INFORMATION

Ordering Number	Package	Pin Assignment						Packing
		1	2	3	4	5	6	
MMDT3904G-AL6-R	SOT-363	E1	B1	C2	E2	B2	C1	Tape Reel

MMDT3904G-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
-----------------	---	---

MARKING



MMDT3904

NPN EPITAXIAL SILICON TRANSISTOR

■ ABSOLUTE MAXIMUM RATINGS ($T_A=25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Collector-Base Voltage	V_{CBO}	60	V
Collector-Emitter Voltage	V_{CEO}	40	V
Emitter-Base Voltage	V_{EBO}	6.0	V
Collector Current - Continuous	I_C	200	mA
Power Dissipation	P_D	200	mW
Thermal Resistance, Junction to Ambient	θ_{JA}	625	$^\circ\text{C/W}$
Junction Temperature	T_J	+150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55 ~ +150	$^\circ\text{C}$

Note: 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.

■ ELECTRICAL CHARACTERISTICS ($T_A=25^\circ\text{C}$ unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS (Note 1)						
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 10\mu\text{A}, I_E = 0$	60			V
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 1.0\text{mA}, I_B = 0$	40			V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 10\mu\text{A}, I_C = 0$	6			V
Collector Cut-off Current	I_{CEX}	$V_{CE} = 30\text{V}, V_{EB(OFF)} = 3.0\text{V}$			50	nA
Base Cut-off Current	I_{BL}	$V_{CE} = 30\text{V}, V_{EB(OFF)} = 3.0\text{V}$			50	nA
ON CHARACTERISTICS (Note 1)						
DC Current Gain	h_{FE}	$I_C = 100\mu\text{A}, V_{CE} = 1.0\text{V}$	40			
		$I_C = 1.0\text{mA}, V_{CE} = 1.0\text{V}$	70			
		$I_C = 10\text{mA}, V_{CE} = 1.0\text{V}$	100		300	
		$I_C = 50\text{mA}, V_{CE} = 1.0\text{V}$	60			
		$I_C = 100\text{mA}, V_{CE} = 1.0\text{V}$	30			
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 10\text{mA}, I_B = 1.0\text{mA}$			0.20	V
		$I_C = 50\text{mA}, I_B = 5.0\text{mA}$			0.30	V
Base- Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 10\text{mA}, I_B = 1.0\text{mA}$	0.65		0.85	V
		$I_C = 50\text{mA}, I_B = 5.0\text{mA}$			0.95	V
SMALL SIGNAL CHARACTERISTICS						
Output Capacitance	C_{OB}	$V_{CB} = 5.0\text{V}, f = 1.0\text{MHz}, I_E = 0$			4.0	pF
Current Gain-Bandwidth Product	f_T	$V_{CE} = 20\text{V}, I_C = 10\text{mA}, f = 100\text{MHz}$	300			MHz
Turn On Time	t_{ON}	$V_{CC}=3\text{V}, V_{BE}=0.5\text{V}, I_C=10\text{mA}, I_{B1}=1\text{mA}$			70	ns
Turn Off Time	t_{OFF}	$I_{B1}=I_{B2}=1\text{mA}$			250	ns

Note: Pulse test: $PW \leq 300\mu\text{s}$, Duty Cycle $\leq 2.0\%$.

UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice.