



MMDT3904

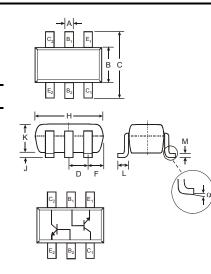
DUAL NPN SMALL SIGNAL SURFACE MOUNT TRANSISTOR

Features

- Epitaxial Planar Die Construction
- Ideal for Low Power Amplification and Switching
- Ultra-Small Surface Mount Package
- Lead Free/RoHS Compliant (Note 2)
- "Green" Device (Note 3 and 4)

Mechanical Data

- Case: SOT-363
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C .
- Terminals: Solderable per MIL-STD-202, Method 208
- Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe).
- Terminal Connections: See Diagram .
- Marking Information: See Page 4
- Ordering Information: See Page 4
- Weight: 0.006 grams (approximate)



SOT-363								
Dim	Min	Мах						
Α	0.10	0.30						
В	1.15	1.35						
С	2.00	2.20						
D	0.65 Nominal							
F	0.30	0.40						
н	1.80	2.20						
J	—	0.10						
к	0.90 1.00							
L	0.25	0.40						
М	0.10	0.25						
α	0°	8°						
All Dimensions in mm								

Maximum Ratings @TA = 25°C unless otherwise specified

Characteristic	Symbol	Value	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	Ic	200	mA		
Power Dissipation (Note 1)	Pd	200	mW		
Thermal Resistance, Junction to Ambient	R _{0JA}	625	°C/W		
Operating and Storage Temperature Range	T _j , T _{STG}	-55 to +150	°C		

Notes: 1. Device mounted on FR-4 PCB; pad layout as shown on Diodes Inc. suggested pad layout documents APO2001,

which can be found on our website at http://www.diodes.com/datasheets/ap02001.pdf.

No purposefully added lead. 2.

3

Diodes Inc.'s "Green" policy can be found on our website at http://www.diodes.com/products/lead_free/index.php. Product manufactured with Date Code UO (week 40, 2007) and newer are built with Green Molding Compound. Product manufactured prior to Date Code UO are built with Non-Green Molding Compound and may contain Halogens or Sb2O3 Fire Retardants. 4.

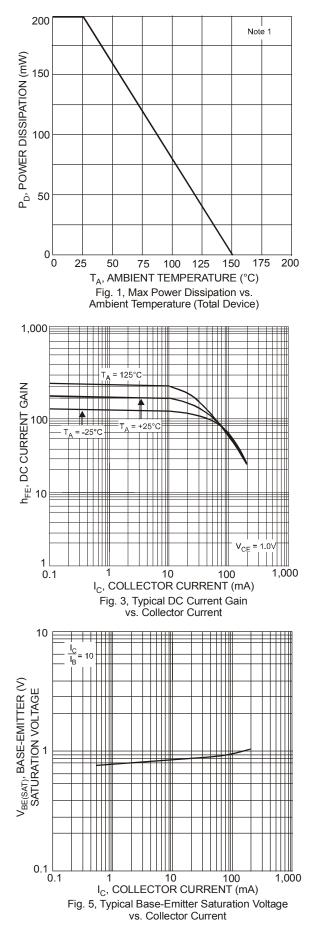


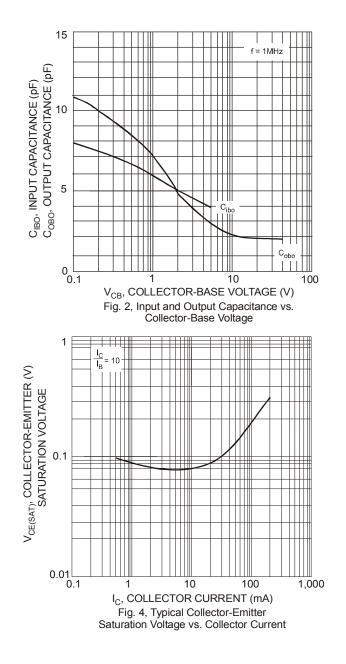
Electrical Characteristics @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Min	Max	Unit	Test Condition			
OFF CHARACTERISTICS (Note 5)	•							
Collector-Base Breakdown Voltage	V _{(BR)CBO}	60	—	V	$I_{\rm C} = 10 \mu A, I_{\rm E} = 0$			
Collector-Emitter Breakdown Voltage	V _{(BR)CEO}	40	_	V	I _C = 1.0mA, I _B = 0			
Emitter-Base Breakdown Voltage	V _{(BR)EBO}	5.0	_	V	I _E = 10μA, I _C = 0			
Collector Cutoff Current	I _{CEX}		50	nA	V _{CE} = 30V, V _{EB(OFF)} = 3.0V			
Base Cutoff Current	I _{BL}		50	nA	V _{CE} = 30V, V _{EB(OFF)} = 3.0V			
ON CHARACTERISTICS (Note 5)	· · · · · ·		•		-			
DC Current Gain	h _{FE}	40 70 100 60 30		_	$ \begin{array}{ll} I_{C} = 100 \mu A, V_{CE} = 1.0V \\ I_{C} = 1.0mA, V_{CE} = 1.0V \\ I_{C} = 10mA, V_{CE} = 1.0V \\ I_{C} = 50mA, V_{CE} = 1.0V \\ I_{C} = 100mA, V_{CE} = 1.0V \end{array} $			
Collector-Emitter Saturation Voltage	V _{CE(SAT)}		0.20 0.30	V	I_{C} = 10mA, I_{B} = 1.0mA I_{C} = 50mA, I_{B} = 5.0mA			
Base-Emitter Saturation Voltage	V _{BE(SAT)}	0.65	0.85 0.95	V	I_{C} = 10mA, I_{B} = 1.0mA I_{C} = 50mA, I_{B} = 5.0mA			
SMALL SIGNAL CHARACTERISTICS								
Output Capacitance	C _{obo}	_	4.0	pF	V_{CB} = 5.0V, f = 1.0MHz, I _E = 0			
Input Capacitance	C _{ibo}	—	8.0	pF	V_{EB} = 0.5V, f = 1.0MHz, I _C = 0			
Input Impedance	h _{ie}	1.0	10	kΩ				
Voltage Feedback Ratio	h _{re}	0.5	8.0	x 10 ⁻⁴	V _{CE} = 10V, I _C = 1.0mA,			
Small Signal Current Gain	h _{fe}	100	400		f = 1.0kHz			
Output Admittance	h _{oe}	1.0	40	μS				
Current Gain-Bandwidth Product	f⊤	300	—	MHz	V _{CE} = 20V, I _C = 10mA, f = 100MHz			
Noise Figure		_	5.0	dB	V_{CE} = 5.0V, I _C = 100µA, R _S = 1.0kΩ, f = 1.0kHz			
SWITCHING CHARACTERISTICS								
Delay Time	t _d		35	ns	V _{CC} = 3.0V, I _C = 10mA,			
Rise Time	tr		35	ns	V _{BE(off)} = - 0.5V, I _{B1} = 1.0mA			
Storage Time	ts		200	ns	V _{CC} = 3.0V, I _C = 10mA,			
Fall Time	t _f		50	ns	$I_{B1} = I_{B2} = 1.0 \text{mA}$			

Notes: 5. Short duration pulse test used to minimize self-heating.







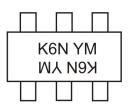


Ordering Information (Note 6)

Device	Packaging	Shipping			
MMDT3904-7-F	SOT-363	3000/Tape & Reel			

Notes: 6. For packaging details, go to our website at http://www.diodes.com/datasheets/ap02007.pdf.

Marking Information



K6N = Product Type Marking Code YM = Date Code Marking Y = Year ex: N = 2002 M = Month ex: 9 = September

Date Code Key

Year	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Code	J	К	L	М	Ν	Р	R	S	Т	U	V	W	Х	Y	Z
Month	Jan	Fe	b I	Mar	Apr	May	Ju	n	Jul	Aug	Sep	Oc	t I	Nov	Dec
Code	1	2		3	4	5	6		7	8	9	0		Ν	D

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