

MMDT2222A

Dual NPN Small Signal Surface Mount Transistor

Description

The MMDT2222A is a Dual NPN Small Signal Surface Mount Transistor, providing the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost effectiveness. The SOT-363 package which has been designed to achieve very low on-state resistance providing also one of the best-in-class figure of merit (FOM)

Features

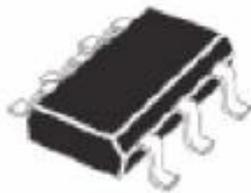
- Epitaxial planar die construction.
- Complementary PNP type available MMBT2907A.
- Ultra-small surface mount package.
- RoHS compliant package

Application

- Dual NPN small signal surface mount transistor

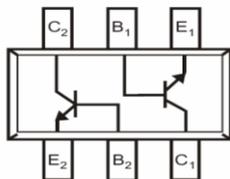
Packing & Order Information

3,000/Reel

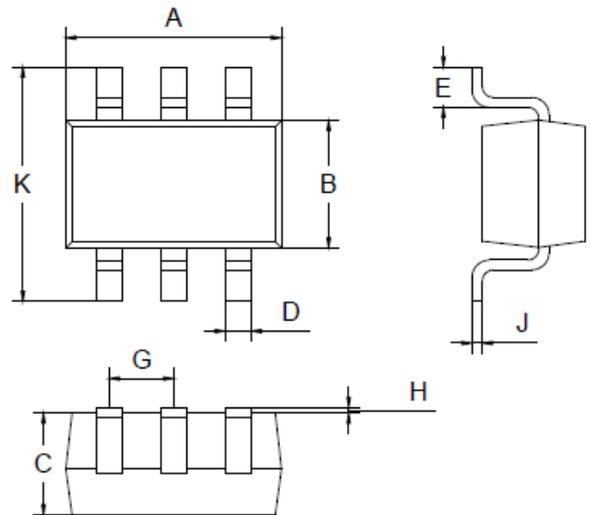


**RoHS
COMPLIANT**

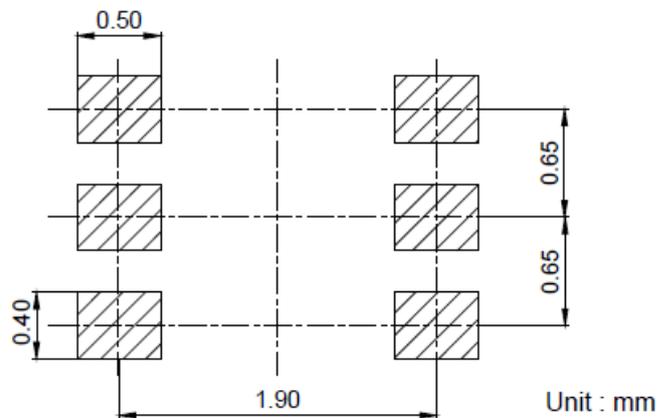
Graphic symbol



SOT-363



SOLDERING FOOTPRINT



Dimensions in mm

SOT-363		
Dim	Min	Max
A	2.00	2.20
B	1.15	1.35
C	0.95 Typical	
D	0.25 Typical	
E	0.25	0.40
G	0.60	0.70
H	0.02	0.10
J	0.10 Typical	
K	2.2	2.4
All Dimensions in mm		

MMDT2222A

Dual NPN Small Signal Surface Mount Transistor

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

MAXIMUM RATING @ $T_a=25^\circ\text{C}$ unless otherwise specified

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage	75	V
V_{CEO}	Collector-Emitter Voltage	40	V
V_{EBO}	Emitter-Base Voltage	6	V
I_C	Collector Current -Continuous	600	mA
P_D	Collector Dissipation	200	mW
$R_{\theta JA}$	Thermal resistance junction to ambient	625	$^\circ\text{C}/\text{W}$
T_j, T_{stg}	Junction and Storage Temperature	-55 to +150	$^\circ\text{C}$

ELECTRICAL CHARACTERISTICS @ $T_a=25^\circ\text{C}$ unless otherwise specified

Symbol	Parameter	Test Conditions	MIN	MAX	UNIT
$V_{(BR)CBO}$	Collector-base breakdown voltage	$I_C = 10\mu\text{A}, I_E = 0$	75		V
$V_{(BR)CEO}$	Collector-emitter breakdown voltage	$I_C = 10\text{mA}, I_B = 0$	40		V
$V_{(BR)EBO}$	Emitter-base breakdown voltage	$I_E = 10\mu\text{A}, I_C = 0$	6		V
I_{CBO}	Collector cut-off current	$V_{CB} = 60\text{V}, I_E = 0$ $V_{CB} = 60\text{V}, I_E = 0, T_A = 150^\circ\text{C}$		10	nA μA
I_{CBX}	Collector cut-off current	$V_{CE} = 60\text{V}, V_{EB(off)} = 3.0\text{V}$		10	nA
I_{EBO}	Emitter cut-off current	$V_{EB} = 3\text{V}, I_C = 0$		10	nA
I_{BL}	Base Cut-off Current	$V_{CE} = 60\text{V}, V_{EB(off)} = 3.0\text{V}$		20	nA
h_{FE}	DC current gain	$V_{CE} = 10\text{V}, I_C = 100\mu\text{A}$	35		-
		$V_{CE} = 10\text{V}, I_C = 1.0\text{mA}$	50		
		$V_{CE} = 10\text{V}, I_C = 10\text{mA}$	75		
		$V_{CE} = 10\text{V}, I_C = 150\text{mA}$	100	300	
		$V_{CE} = 10\text{V}, I_C = 500\text{mA}$	40		
		$V_{CE} = 10\text{V}, I_C = 10\text{mA}, T_A = 55^\circ\text{C}$	50		
		$V_{CE} = 1\text{V}, I_C = 150\text{mA}$	35		
$V_{CE(sat)}$	Collector-emitter saturation voltage	$I_C = 500\text{mA}, I_B = 50\text{mA}$ $I_C = 150\text{mA}, I_B = 15\text{mA}$		1.0 0.3	V
$V_{BE(sat)}$	Base-emitter saturation voltage	$I_C = 500\text{mA}, I_B = 50\text{mA}$ $I_C = 150\text{mA}, I_B = 15\text{mA}$	0.6	2.0 1.2	V
f_T	Transition frequency	$V_{CE} = 20\text{V}, I_C = 20\text{mA}, f = 100\text{MHz}$	300		MHz

MMDT2222A

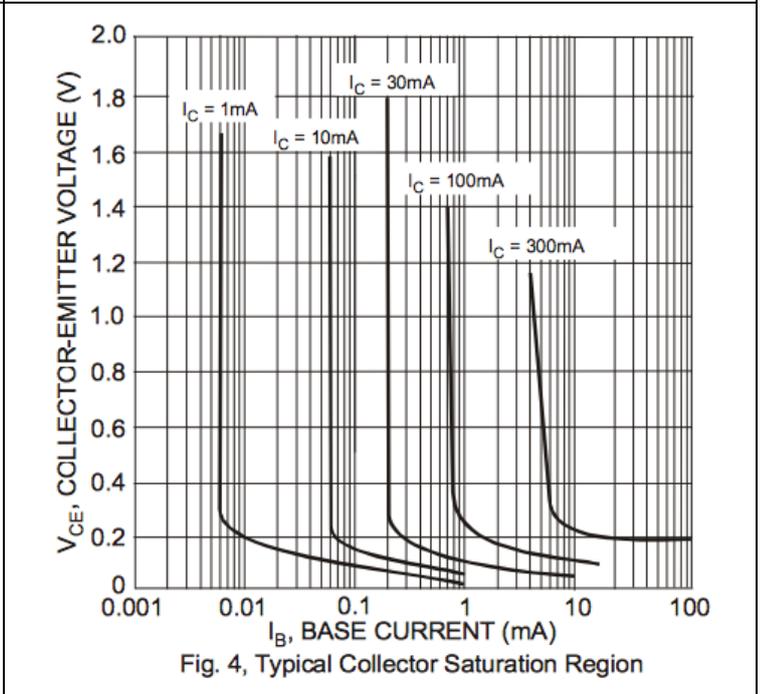
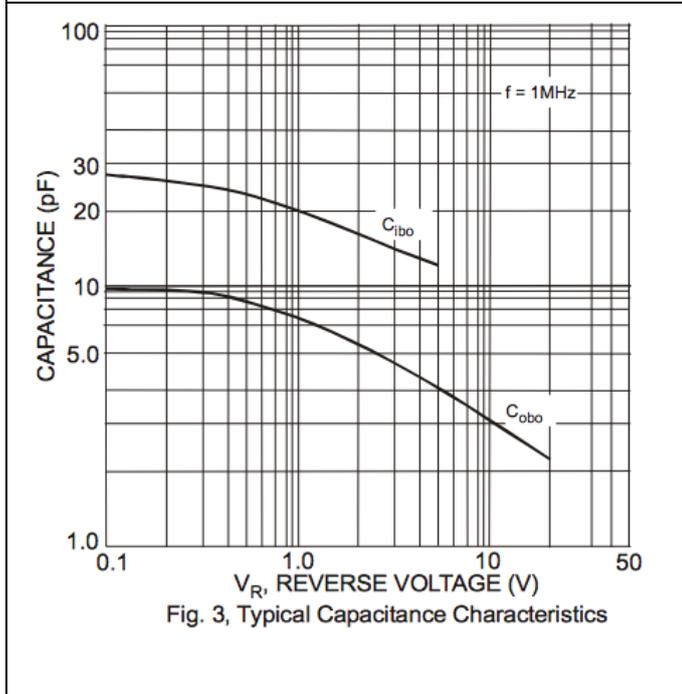
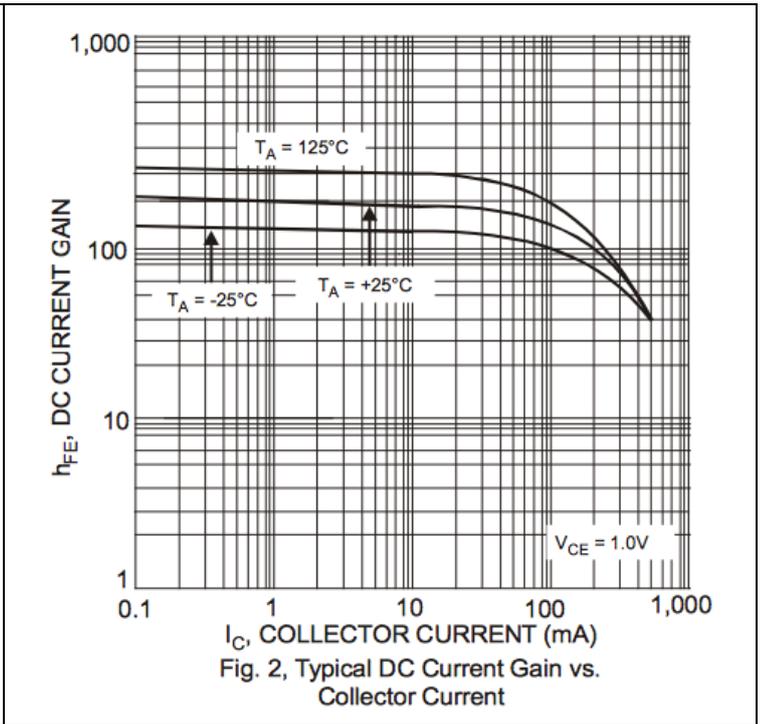
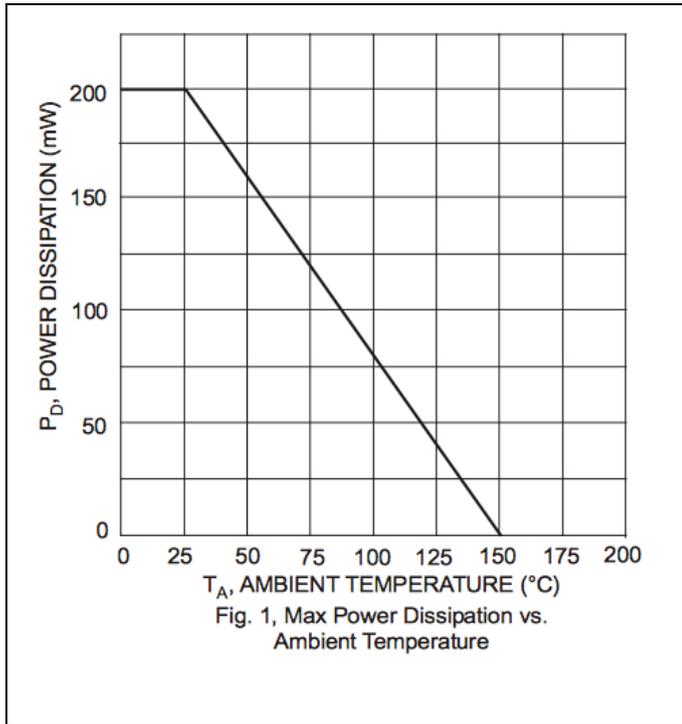
Dual NPN Small Signal Surface Mount Transistor

ELECTRICAL CHARACTERISTICS @ $T_a=25^{\circ}\text{C}$ unless otherwise specified

Symbol	Parameter	Test Conditions	MIN	MAX	UNIT
C_{obo}	Output capacitance	$V_{CB} = 10\text{ V}, I_E = 0, f = 1.0\text{MHz}$		8	pF
C_{ibo}	Input capacitance	$V_{EB} = 0.5\text{ V}, I_C = 0, f = 1.0\text{MHz}$		25	pF
NF	Noise Figure	$V_{CE} = 10\text{ V}, f = 1.0\text{kHz},$ $I_C = 100\mu\text{A}, R_S = 1.0\text{k}\Omega$		4	dB
t_d	Delay time	$V_{CC} = 30\text{ V}, V_{BE(off)} = -0.5\text{ V}$		10	ns
t_r	Rise time	$I_C = 150\text{mA}, I_{B1} = 15\text{mA}$		25	ns
t_s	Storage time	$V_{CC} = 30\text{ V}, I_C = 150\text{mA}$		225	ns
t_f	Fall time	$I_{B1} = -I_{B2} = 15\text{mA}$		60	ns

MMDT2222A

Dual NPN Small Signal Surface Mount Transistor



MMDT2222A

Dual NPN Small Signal Surface Mount Transistor

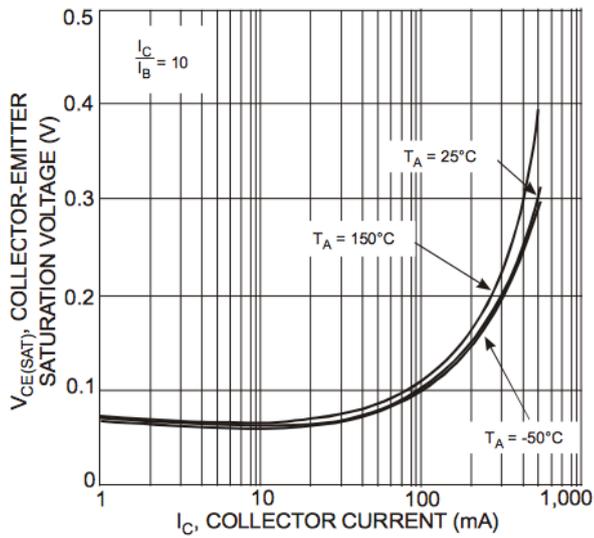


Fig. 5, Typical Collector-Emitter Saturation Voltage vs. Collector Current

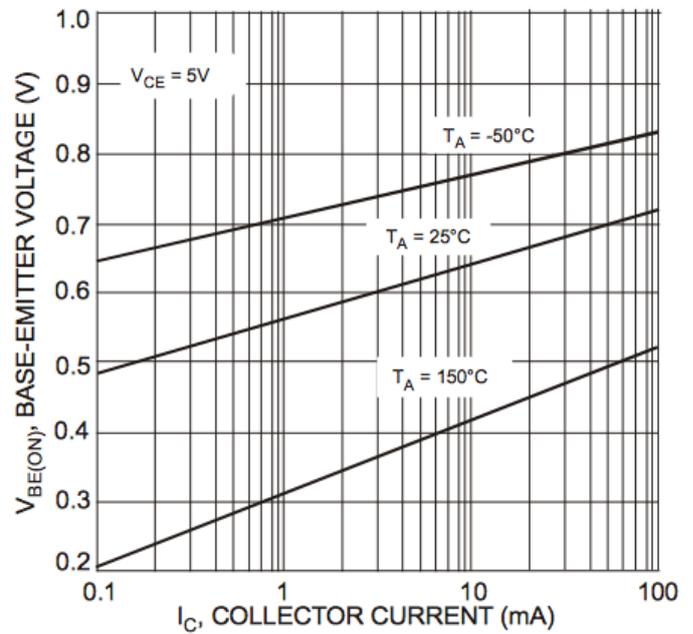


Fig. 6, Typical Base-Emitter Voltage vs. Collector Current

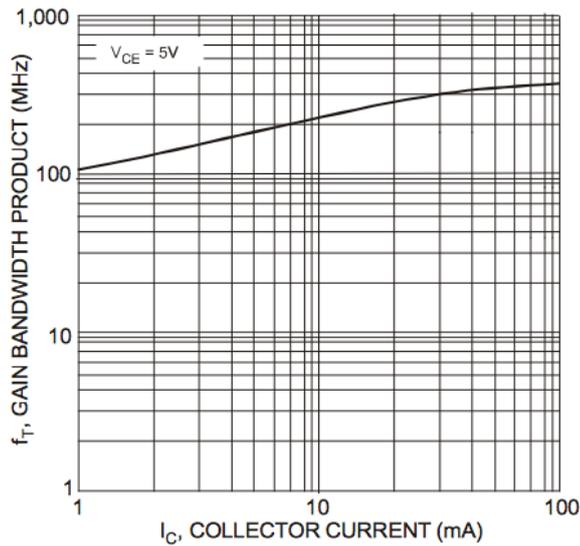


Fig. 7, Typical Gain Bandwidth Product vs. Collector Current

MMDT2222A

Dual NPN Small Signal Surface Mount Transistor

Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE

WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Bruckewell Technology Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Bruckewell"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Bruckewell makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Bruckewell disclaims

- (i) Any and all liability arising out of the application or use of any product.
- (ii) Any and all liability, including without limitation special, consequential or incidental damages.
- (iii) Any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Bruckewell's knowledge of typical requirements that are often placed on Bruckewell products in generic applications.

Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time.

Product specifications do not expand or otherwise modify Bruckewell's terms and conditions of purchase, including but not limited to the warranty expressed therein.