

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

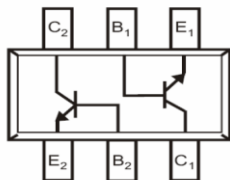
Packing & Order Information

3,000/Reel

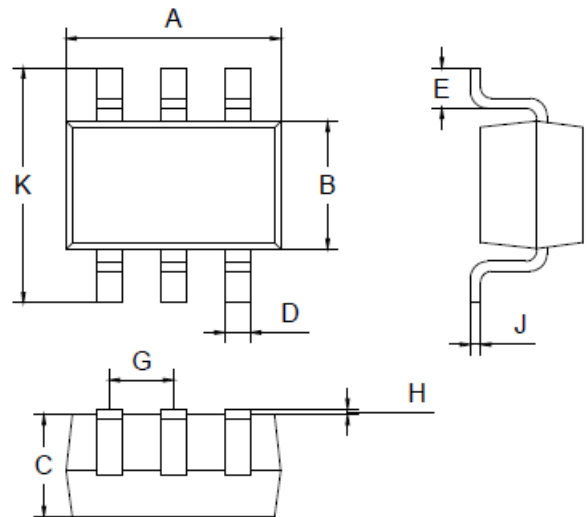


**RoHS
COMPLIANT**

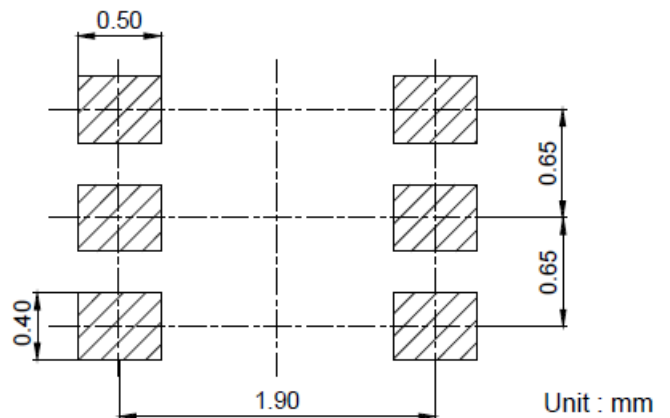
Graphic symbol



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		

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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

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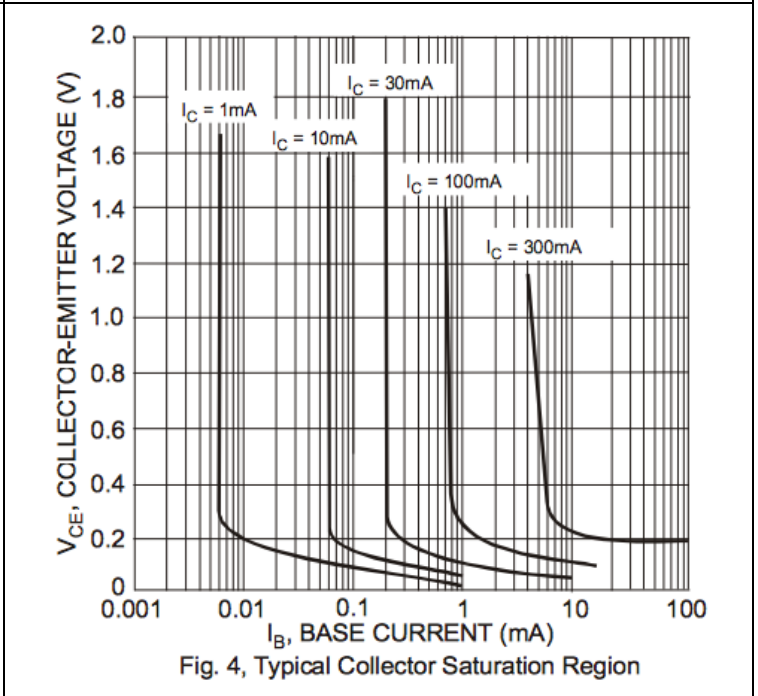
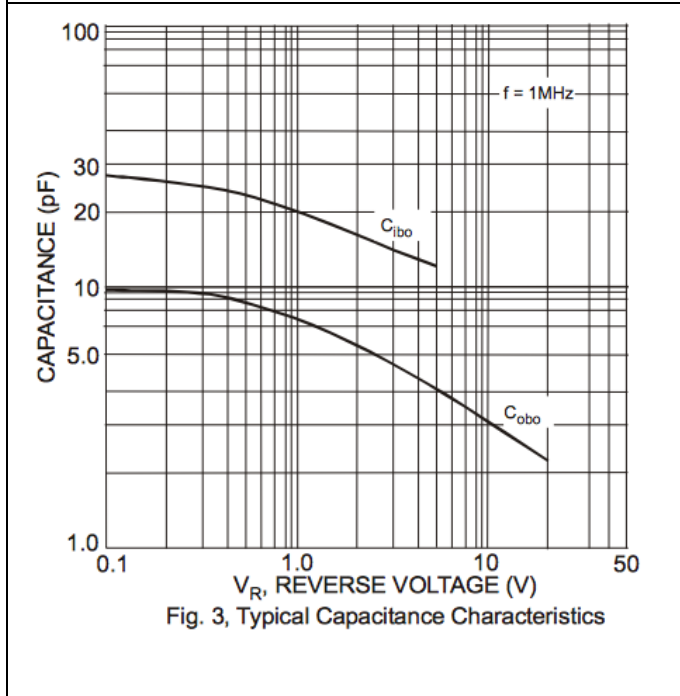
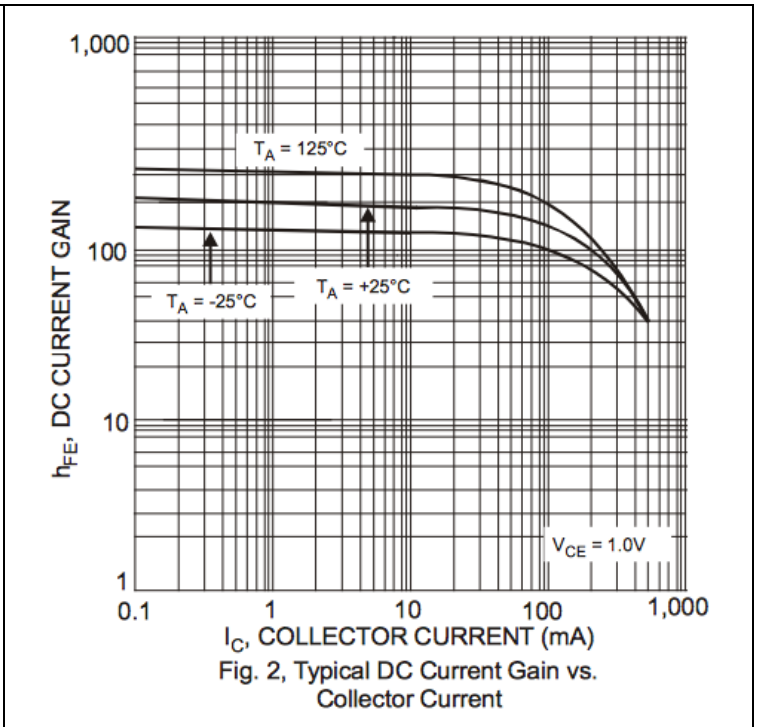
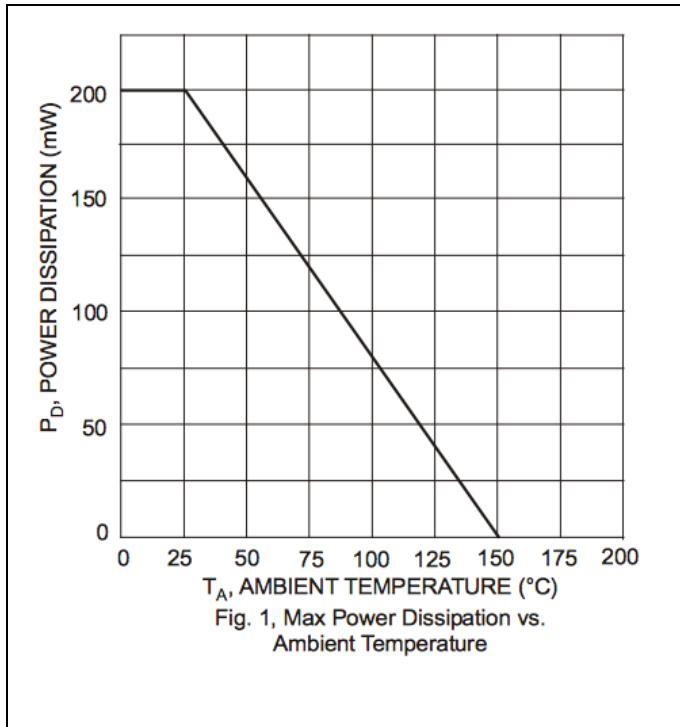
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ELECTRICAL CHARACTERISTICS @ $T_a=25^{\circ}\text{C}$ unless otherwise specified

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

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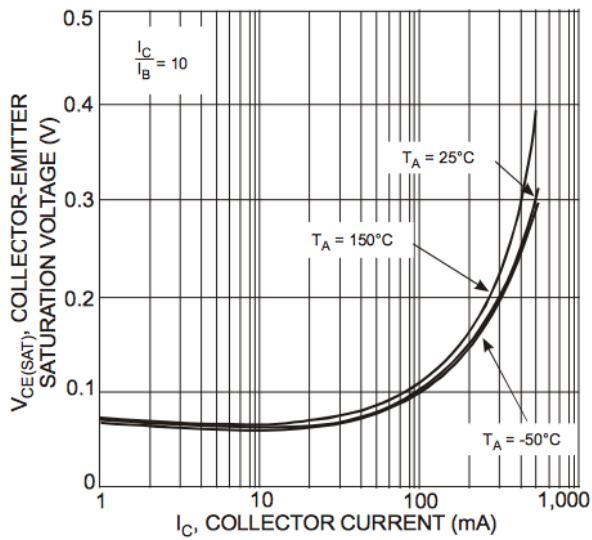


Fig. 5, Typical Collector-Emitter Saturation Voltage vs. Collector Current

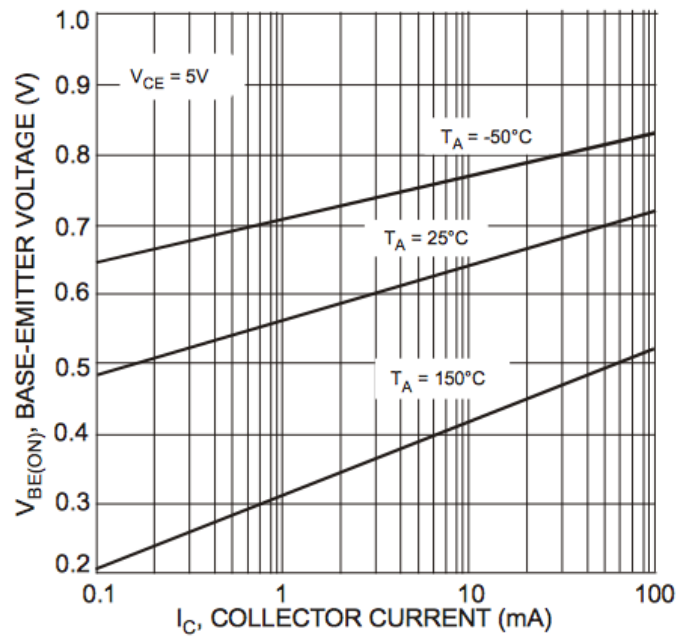


Fig. 6, Typical Base-Emitter Voltage vs. Collector Current

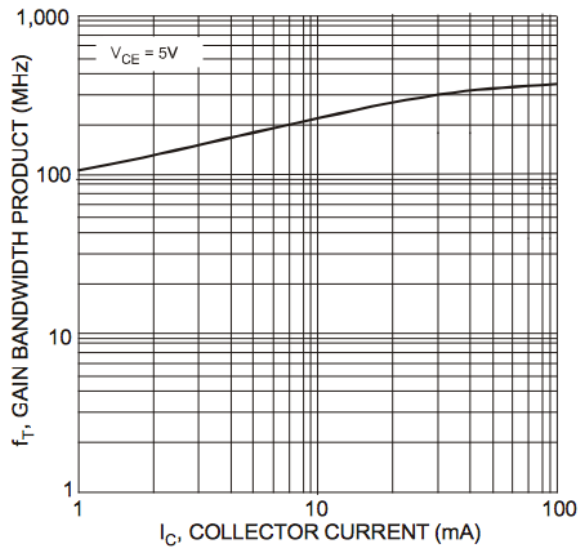


Fig. 7, Typical Gain Bandwidth Product vs. Collector Current

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