



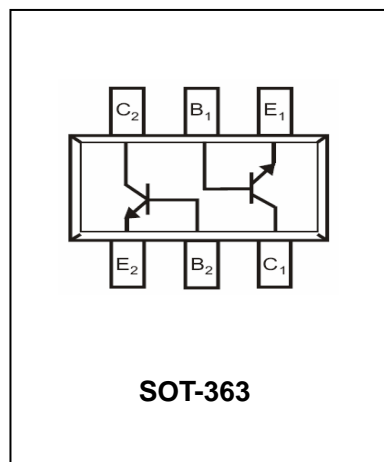
## Dual NPN Small Signal Surface Mount Transistor **MMDT4401**

### FEATURES

- Epitaxial planar die construction.
- Ultra-small surface mount package.
- Ideal for low power amplification and switching.



Lead-free



### APPLICATIONS

- Dual NPN small signal surface mount transistor.

### ORDERING INFORMATION

Type No.	Marking	Package Code
MMDT4401	K2X	SOT-363

### MAXIMUM RATING @ Ta=25°C unless otherwise specified

Symbol	Parameter	Value	Unit
V <sub>CBO</sub>	Collector-Base Voltage	60	V
V <sub>CEO</sub>	Collector-Emitter Voltage	40	V
V <sub>EBO</sub>	Emitter-Base Voltage	6	V
I <sub>C</sub>	Collector Current -Continuous	600	mA
P <sub>D</sub>	Power Dissipation	200	mW
R <sub>θJA</sub>	Thermal Resistance, Junction to Ambient	625	°C/W
T <sub>j</sub> , T <sub>stg</sub>	Junction and Storage Temperature	-55 to +150	°C



## Dual NPN Small Signal Surface Mount Transistor **MMDT4401**

ELECTRICAL CHARACTERISTICS @ Ta=25°C unless otherwise specified

Parameter	Symbol	Test conditions	MIN	MAX	UNIT
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C=100\mu A, I_E=0$	60	-	V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C=1mA, I_B=0$	40	-	V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E=100\mu A, I_C=0$	6	-	V
Collector cut-off current	$I_{CEX}$	$V_{CE}=35V, V_{EB(OFF)}=0.4V$	-	0.1	$\mu A$
Base cut-off current	$I_{BL}$	$V_{CE}=35V, V_{EB(OFF)}=0.4V$	-	0.1	$\mu A$
DC current gain	$h_{FE}$	$V_{CE}=1V, I_C=0.1mA$	20	-	-
		$V_{CE}=1V, I_C=1.0mA$	40	-	
		$V_{CE}=1V, I_C=10mA$	80	-	
		$V_{CE}=1V, I_C=150mA$	100	300	
		$V_{CE}=2V, I_C=500mA$	40	-	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C=150mA, I_B=15mA$ $I_C=500mA, I_B=50mA$	-	0.4 0.75	V
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C=150mA, I_B=15mA$ $I_C=500mA, I_B=50mA$	0.75 -	0.95 1.2	V
Transition frequency	$f_T$	$V_{CE}=10V, I_C=20mA, f=1MHz$	250		MHz
Output Capacitance	$C_{obo}$	$V_{CB}=5V, f=1.0MHz, I_E=0$	-	6.5	pF
Input Capacitance	$C_{ibo}$	$V_{EB}=0.5V, f=1.0MHz, I_C=0$	-	30	pF
Delay time	$t_d$	$V_{CC}=30V, V_{BE(off)}=2V$ $I_C=150mA, I_{B1}=15mA$		15	ns
Rise time	$t_r$			20	ns
Storage time	$t_s$	$V_{CC}=30V, I_C=150mA$ $I_{B1}=I_{B2}=15mA$		225	ns
Fall time	$t_f$			30	ns



# Dual NPN Small Signal Surface Mount Transistor MMDT4401

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

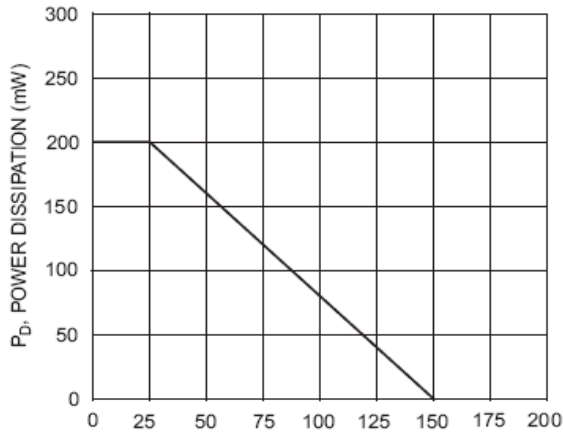


Fig. 1 Max Power Dissipation vs Ambient Temperature

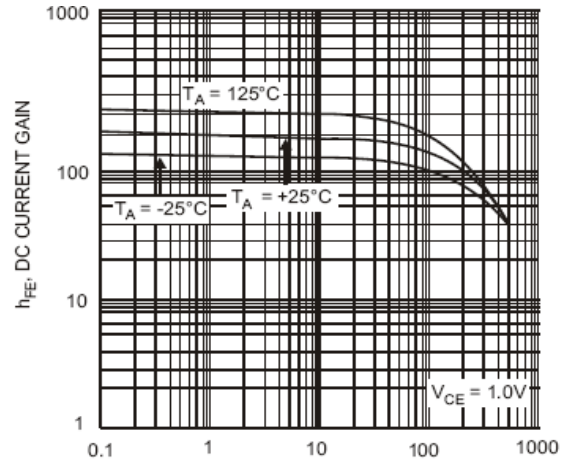


Fig. 2 Typical DC Current Gain vs Collector Current

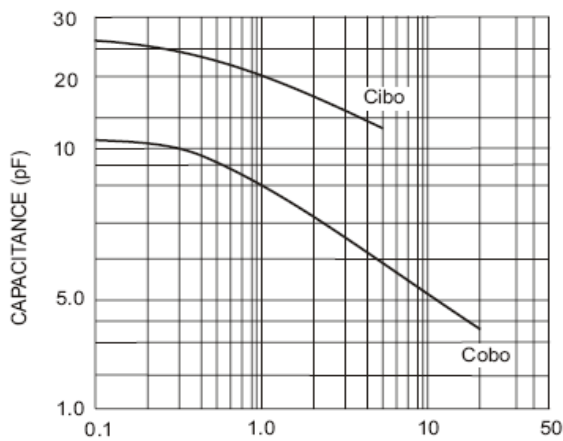


Fig. 3 Typical Capacitance

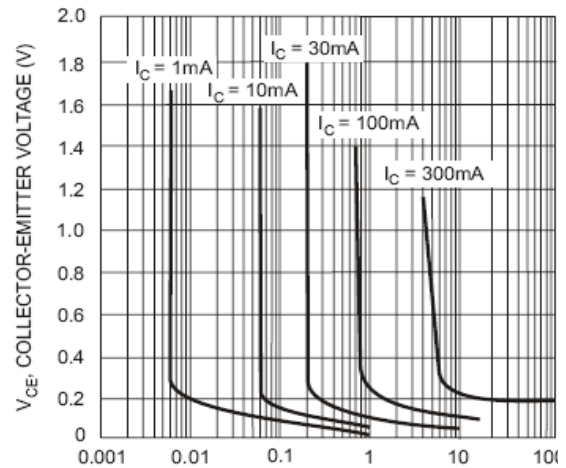


Fig. 4 Typical Collector Saturation Region

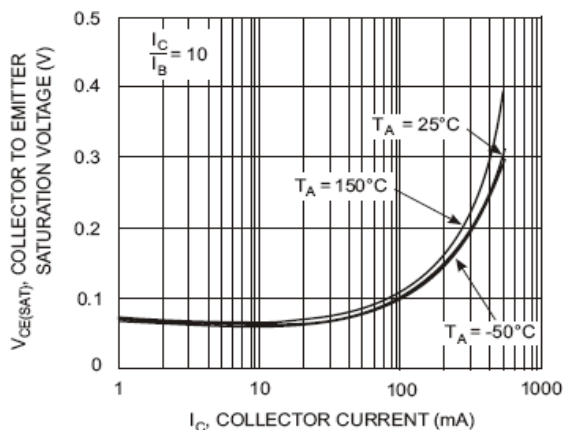


Fig. 5 Collector Emitter Saturation Voltage vs. Collector Current

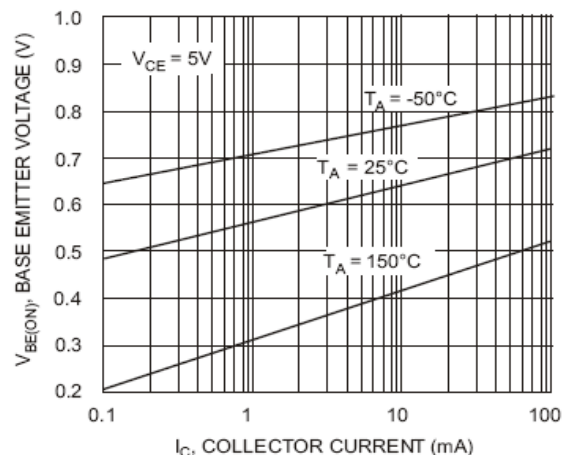


Fig. 6 Base Emitter Voltage vs. Collector Current

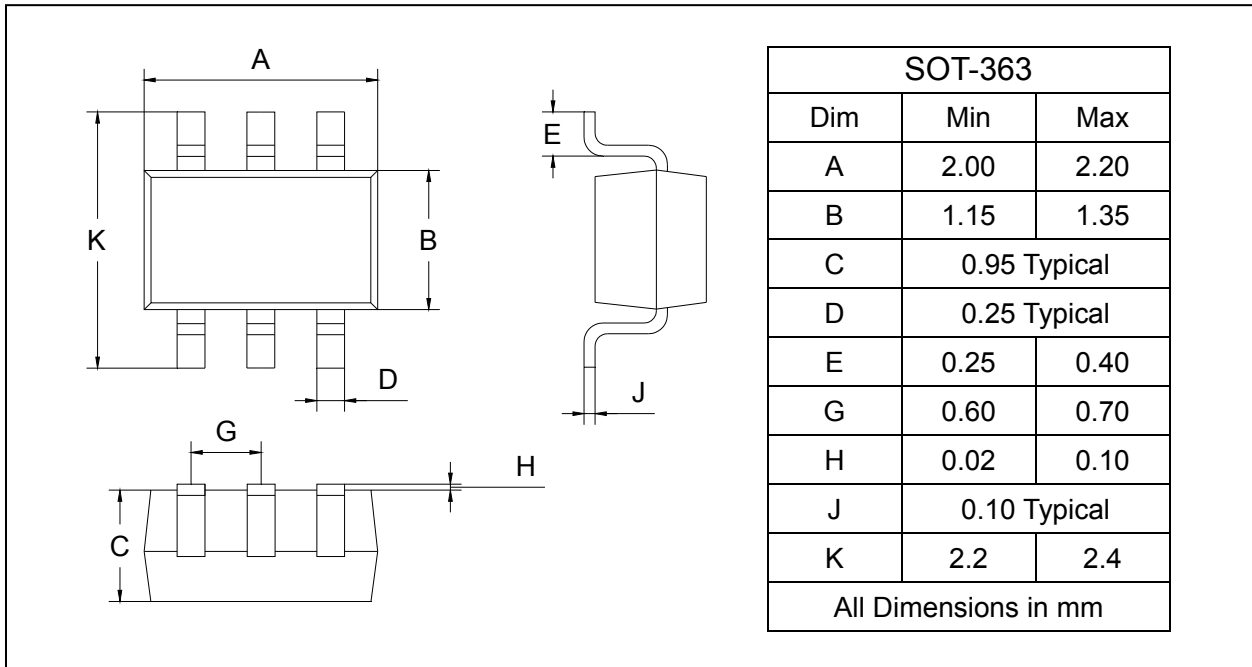


**Dual NPN Small Signal Surface Mount Transistor MMDT4401**

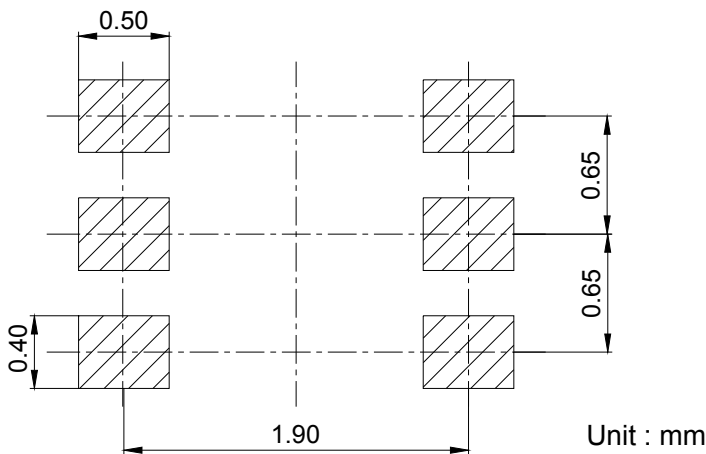
**PACKAGE OUTLINE**

Plastic surface mounted package

SOT-363



**SOLDERING FOOTPRINT**



**PACKAGE INFORMATION**

Device	Package	Shipping
MMDT4401	SOT-363	3000/Tape&Reel