

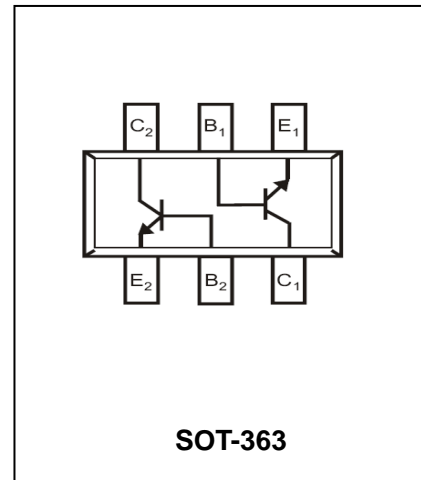
## Dual NPN Small Signal Surface Mount Transistor

### FEATURES

- Epitaxial planar die construction.
- Ideal for low power amplification and switching.
- Ultra-small surface mount package
- Also available in lead free version.

### APPLICATIONS

- General switching and amplification



### 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	0.2	A
P <sub>tot</sub>	total power dissipation	0.2	W
R <sub>θJA</sub>	Thermal Resistance, Junction to Ambient	625	°C/W
T <sub>stg</sub>	storage temperature	150	°C
T <sub>j</sub>	junction temperature	-55 to +150	°C

## ELECTRICAL CHARACTERISTICS @ Ta=25°C unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_{(BR)CBO}$	Collector-base breakdown voltage	$I_C=10\mu A, I_E=0$	60		V
$V_{(BR)CEO}$	Collector-emitter breakdown voltage	$I_C=1mA, I_B=0$	40		V
$V_{(BR)EBO}$	Emitter-base breakdown voltage	$I_E=10\mu A, I_C=0$	5		V
$I_{CEX}$	collector cut-off current	$V_{CE}=30V, V_{EB(OFF)}=3.0V$	-	50	nA
$I_{BL}$	Base cut-off current	$V_{CE}=30V, V_{EB(OFF)}=3.0V$	-	50	nA
$h_{FE}$	DC current gain	$V_{CE}=1V, I_C=0.1mA$	40	-	
		$V_{CE}=1V, I_C=1mA$	70	-	
		$V_{CE}=1V, I_C=10mA$	100	300	
		$V_{CE}=1V, I_C=50mA$	60	-	
		$V_{CE}=1V, I_C=100mA$	30	-	
$V_{CE(sat)}$	collector-emitter saturation voltage	$I_C=10mA, I_B=1mA$	-	200	mV
		$I_C=50mA, I_B=5mA$	-	300	mV
$V_{BE(sat)}$	base-emitter saturation voltage	$I_C=10mA, I_B=1mA$	650	850	mV
		$I_C=50mA, I_B=5mA$	-	950	mV
$C_{obo}$	Output capacitance	$I_E=0, V_{CB}=5V, f=1MHz$	-	4	pF
$C_{ibo}$	Input capacitance	$I_C=0, V_{EB}=0.5V, f=1MHz$	-	8	pF
$f_T$	transition frequency	$I_C=10mA, V_{CE}=20V, f=100MHz$	300	-	MHz
NF	noise figure	$I_C=0.1mA, V_{CE}=5V, R_S=1k\Omega, f=1kHz$	-	5	dB
$t_d$	delay time	$V_{CC}=3V, V_{BE(off)}=-0.5V$	-	35	ns
$t_r$	rise time	$I_C=10mA, I_{B1}=1mA$	-	35	ns
$t_s$	storage time	$V_{CC}=3V, I_C=10mA$	-	200	ns
$t_f$	fall time	$I_{B1}=I_{B2}=1mA$	-	50	ns

## TYPICAL CHARACTERISTICS @ Ta=25°C unless otherwise specified

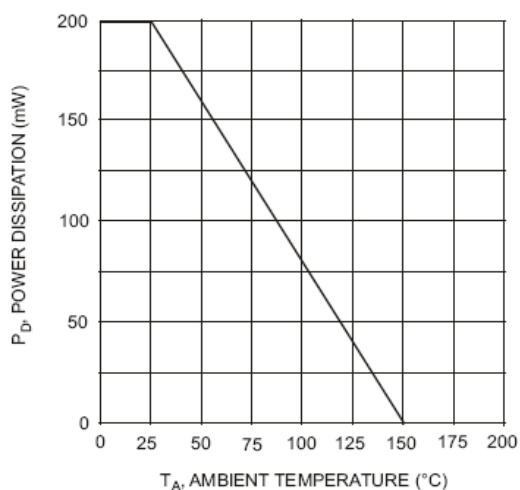


Fig. 1. Max Power Dissipation vs Ambient Temperature

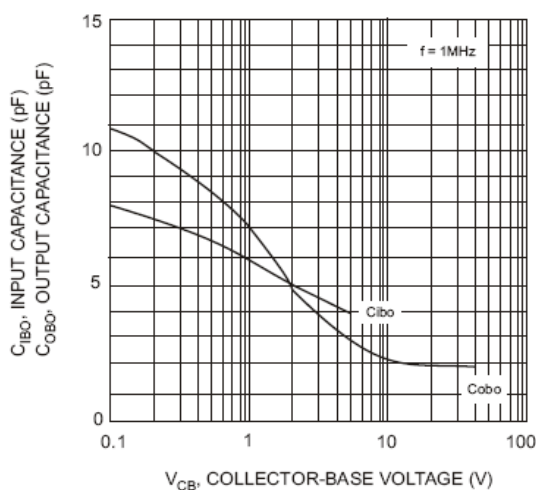


Fig. 2. Input and Output Capacitance vs. Collector-Base Voltage

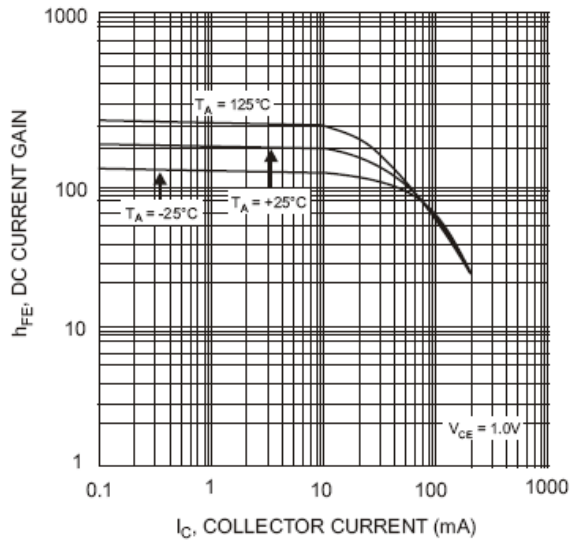


Fig. 3, Typical DC Current Gain vs Collector Current

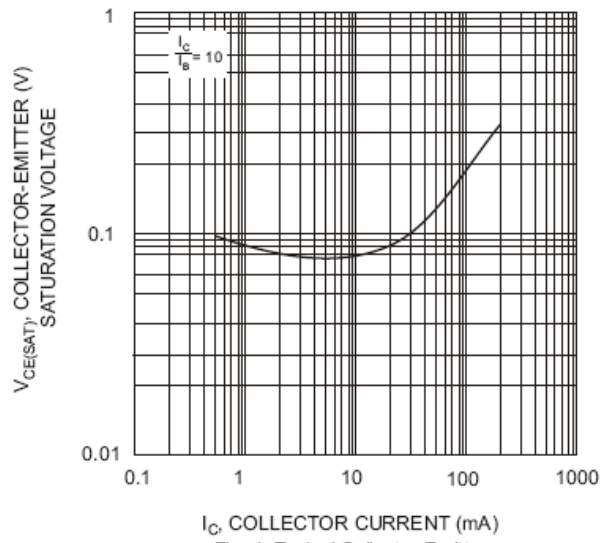


Fig. 4, Typical Collector-Emitter Saturation Voltage vs. Collector Current

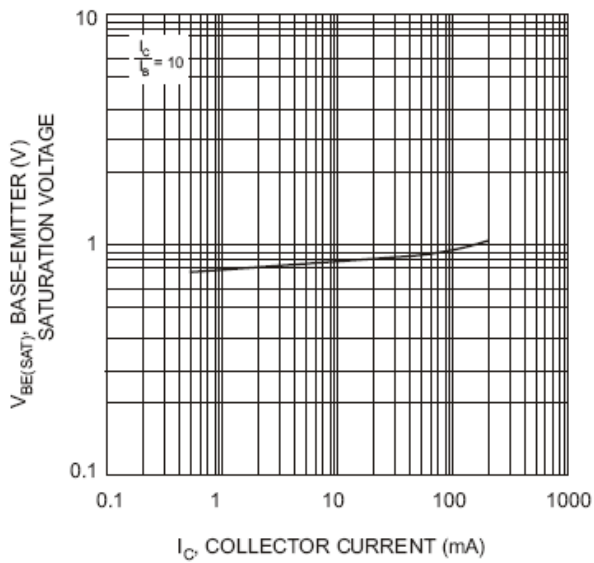
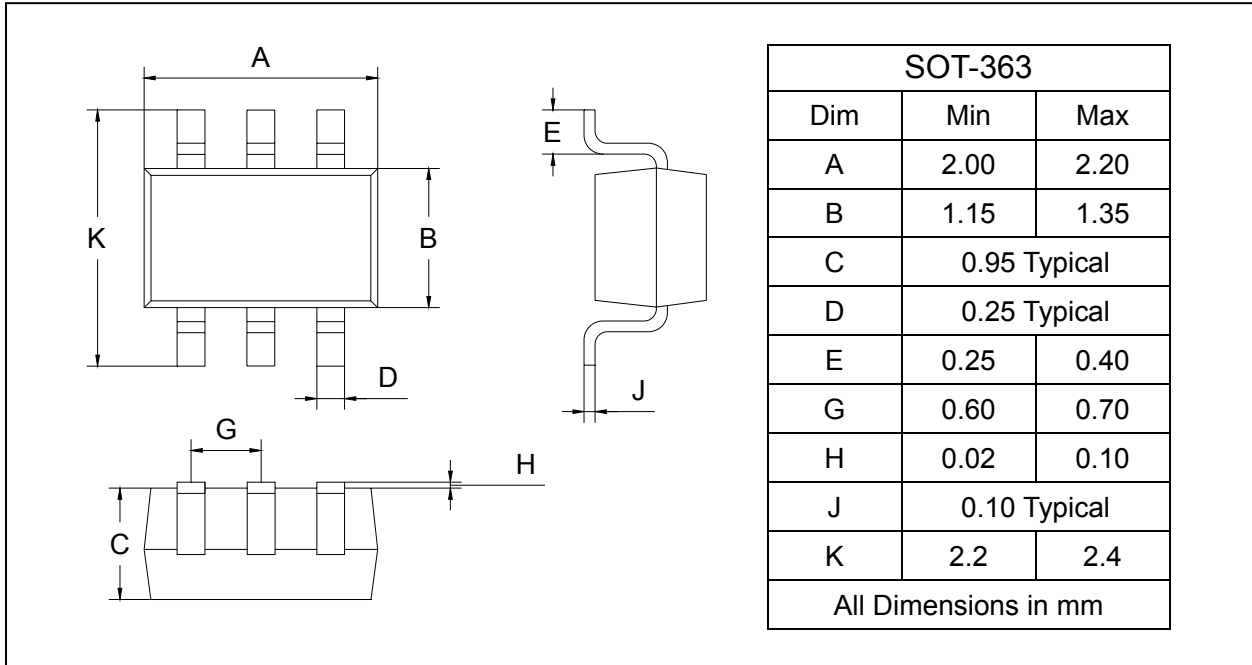


Fig. 5, Typical Base-Emitter Saturation Voltage vs. Collector Current

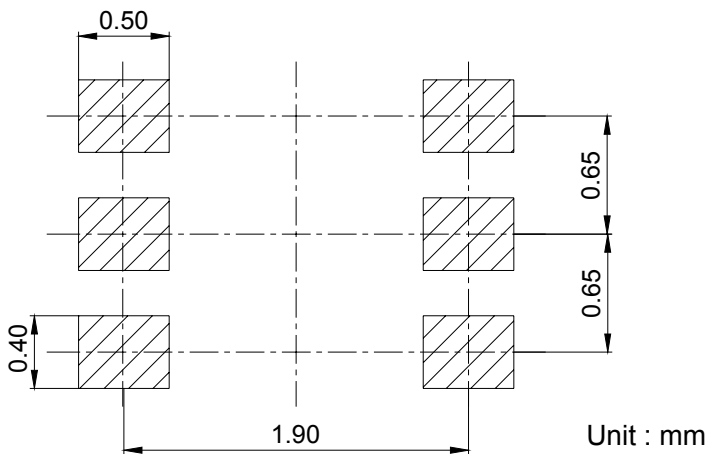
## PACKAGE OUTLINE

Plastic surface mounted package

SOT-363



## SOLDERING FOOTPRINT



## PACKAGE INFORMATION

Device	Package	Shipping
MMDT3904	SOT-363	3000/Tape&Reel