# MMDT3904

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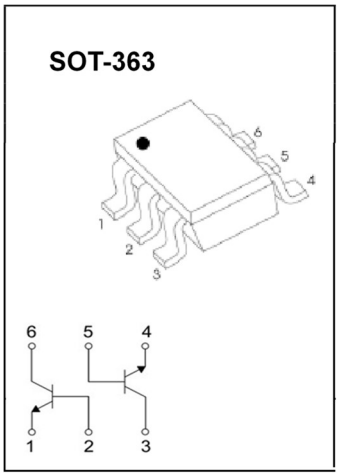
## SOT-363 Plastic-Encapsulate Transistors

### General description
SOT-363 Plastic-Encapsulate Transistors



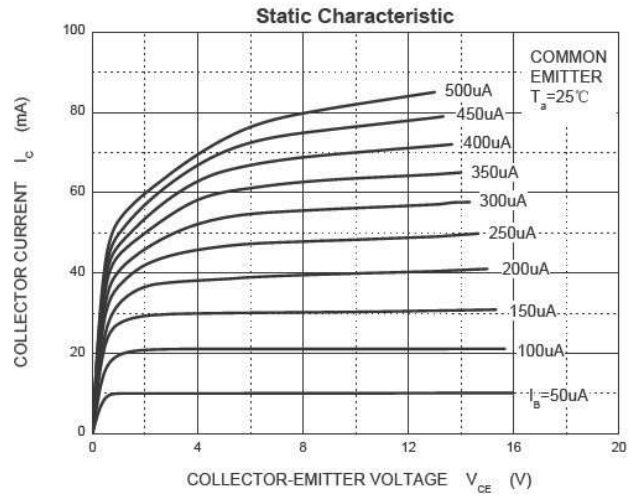

MARKING : K6N

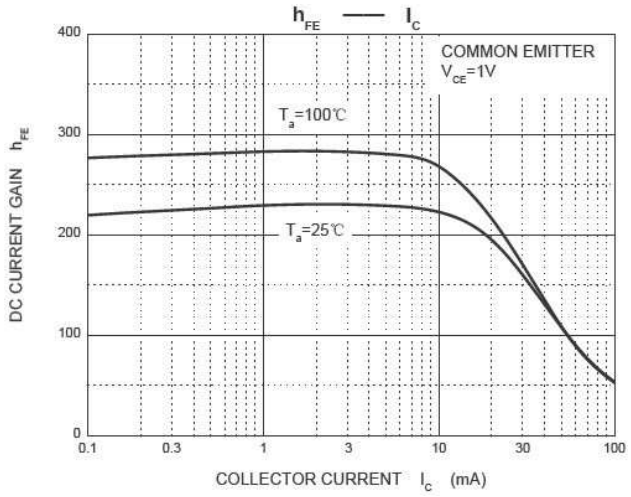
### FEATURES
- DUAL TRANSISTOR (NPN+NPN)
- Epitaxial planar die construction
- Ideal for low power amplification and switching

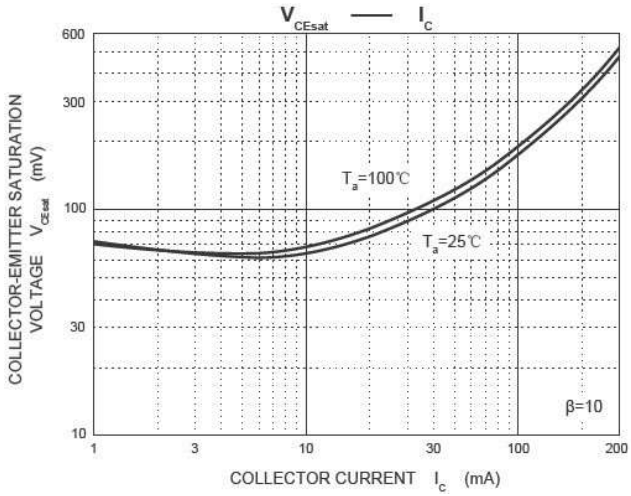
| Symbol | Parameter | Value | Units |
|---|---|---|---|
| $V_{CBO}$ | Collector-Base Voltage | 60 | V |
| $V_{CEO}$ | Collector-Emitter Voltage | 40 | V |
| $V_{EBO}$ | Emitter-Base Voltage | 5 | V |
| $I_C$ | Collector Current -Continuous | 0.2 | A |
| $P_C$ | Collector Power Dissipation | 0.2 | W |
| $T_J$ | Junction Temperature | 150 | ℃ |
| $T_{stg}$ | Storage Temperature | -55-150 | ℃ |

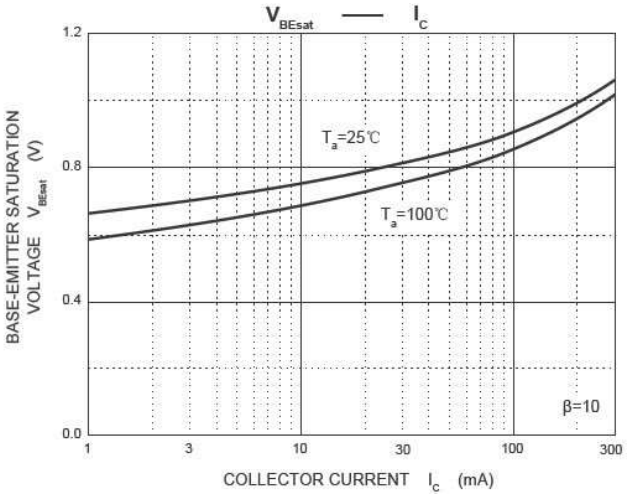
**Absolute Maximum Ratings(Ta=25℃ unless otherwise specified)**

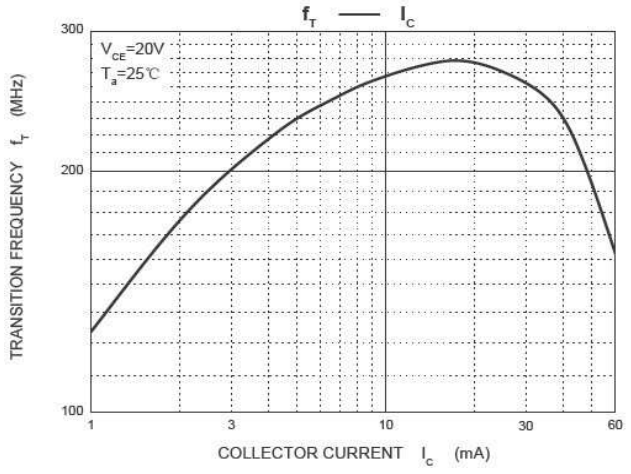
| Parameter | Symbol | Test conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Collector-base breakdown voltage | $V_{(BR)CBO}$ | $I_C$=10μA,$I_E$=0 | 60 | | | V |
| Collector-emitter breakdown voltage | $V_{(BR)CEO}$ | $I_C$=1mA,$I_B$=0 | 40 | | | V |
| Emitter-base breakdown voltage | $V_{(BR)EBO}$ | $I_E$=10μA,$I_C$=0 | 5 | | | V |
| Collector cut-off current | $I_{CBO}$ | $V_{CB}$=30V,$I_E$=0 | | | 0.05 | μA |
| Emitter cut-off current | $I_{EBO}$ | $V_{EB}$=5V,$I_C$=0 | | | 0.05 | μA |
| Collector cut-off current | $I_{CEX}$ | $V_{CE}$=30V,$V_{BE(off)}$=3V | | | 0.05 | μA |
| DC current gain | $h_{FE(1)}$ | $V_{CE}$=1V,$I_C$=0.1mA | 40 | | | |
| | $h_{FE(2)}$ | $V_{CE}$=1V,$I_C$=1mA | 70 | | | |
| | $h_{FE(3)}$ | $V_{CE}$=1V,$I_C$=10mA | 100 | | 300 | |
| | $h_{FE(4)}$ | $V_{CE}$=1V,$I_C$=50mA | 60 | | | |
| | $h_{FE(5)}$ | $V_{CE}$=1V,$I_C$=100mA | 30 | | | |
| Collector-emitter saturation voltage | $V_{CE(sat)1}$ | $I_C$=10mA,$I_B$=1mA | | | 0.2 | V |
| | $V_{CE(sat)2}$ | $I_C$=50mA,$I_B$=5mA | | | 0.3 | V |
| Base-emitter saturation voltage | $V_{BE(sat)1}$ | $I_C$=10mA,$I_B$=1mA | 0.65 | | 0.85 | V |
| | $V_{BE(sat)2}$ | $I_C$=50mA,$I_B$=5mA | | | 0.95 | V |
| Transition frequency | $f_T$ | $V_{CE}$=20V,$I_C$=10mA,f=100MHz | 300 | | | MHz |
| Collector output capacitance | $C_{ob}$ | $V_{CB}$=5V,$I_E$=0,f=1MHz | | | 4 | pF |
| Noise figure | NF | $V_{CE}$=5V,$I_c$=0.1mA,f=1kHz,$R_S$=1KΩ | | | 5 | dB |
| Delay time | $t_d$ | $V_{CC}$=3V, $V_{BE(off)}$=-0.5V<br>$I_C$=10mA , $I_{B1}$=-$I_{B2}$= 1mA | | | 35 | nS |
| Rise time | $t_r$ | | | | 35 | nS |
| Storage time | $t_s$ | $V_{CC}$=3V, $I_C$=10mA $I_{B1}$=-<br>$I_{B2}$=1mA | | | 200 | nS |
| Fall time | $t_f$ | | | | 50 | nS |

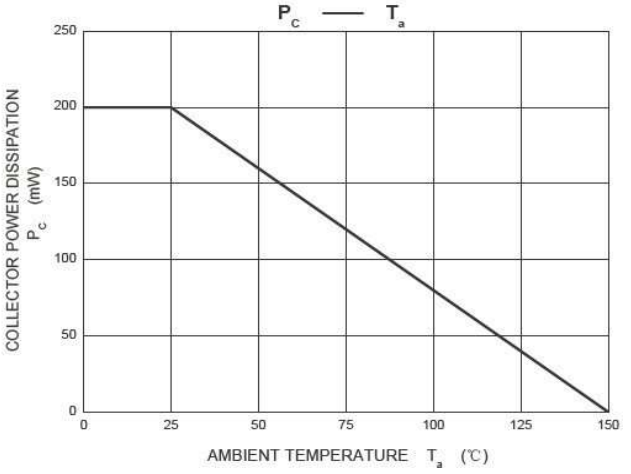

Static Characteristic
COMMON EMITTER
$T_a$=25℃
500uA
450uA
400uA
350uA
300uA
250uA
200uA
150uA
100uA
$I_B$=50uA
COLLECTOR CURRENT $I_C$ (mA)
COLLECTOR-EMITTER VOLTAGE $V_{CE}$ (V)


$h_{FE}$ — $I_C$
COMMON EMITTER
$V_{CE}$=1V
$T_a$=100℃
$T_a$=25℃
DC CURRENT GAIN $h_{FE}$
COLLECTOR CURRENT $I_C$ (mA)

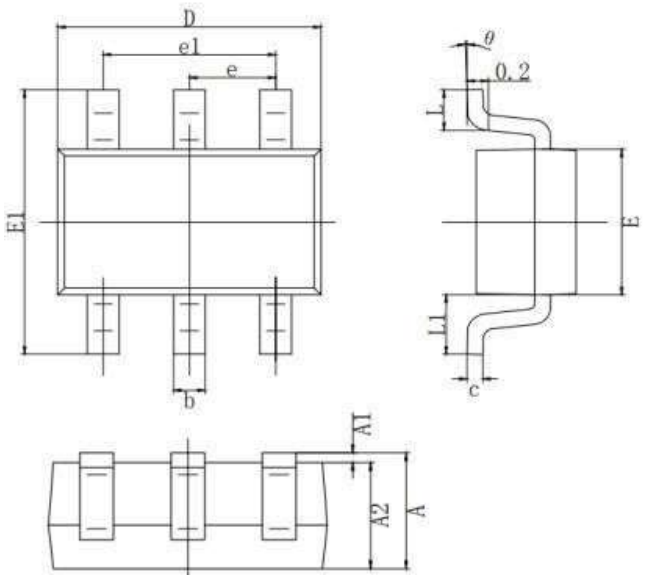

$V_{CEsat}$ — $I_C$
$T_a$=100℃
$T_a$=25℃
β=10
COLLECTOR-EMITTER SATURATION VOLTAGE $V_{CEsat}$ (mV)
COLLECTOR CURRENT $I_C$ (mA)


$V_{BEsat}$ — $I_C$
$T_a$=25℃
$T_a$=100℃
β=10
BASE-EMITTER SATURATION VOLTAGE $V_{BEsat}$ (V)
COLLECTOR CURRENT $I_C$ (mA)


$f_T$ — $I_C$
$V_{CE}$=20V
$T_a$=25℃
TRANSITION FREQUENCY $f_T$ (MHz)
COLLECTOR CURRENT $I_C$ (mA)


$P_C$ — $T_a$
COLLECTOR POWER DISSIPATION $P_C$ (mW)
AMBIENT TEMPERATURE $T_a$ (℃)

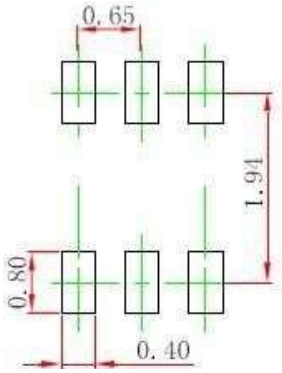
## SOT-363 PACKAGE OUTLINE Plastic surface mounted package




| SYMBOL | MILLIMETER | |
|---|---|---|
| | MIN | MAX |
| A | 0.900 | 1.100 |
| A1 | 0.000 | 0.100 |
| A2 | 0.900 | 1.000 |
| b | 0.150 | 0.350 |
| c | 0.080 | 0.150 |
| D | 2.000 | 2.200 |
| E | 1.150 | 1.350 |
| E1 | 2.150 | 2.450 |
| e | 0.650 TYP. | |
| e1 | 1.200 | 1.400 |
| L | 0.525 REF. | |
| L1 | 0.260 | 0.460 |
| θ | 0° | 8° |

Precautions: PCB Design

Recommended land dimensions for SOT-363. Electrode patterns for PCBs




Note:
1.Controlling dimension:in millimeters.
2.General tolerance:± 0.05mm.
3.The pad layout is for reference purposes only.

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