



JIANGSU CHANGJING ELECTRONICS TECHNOLOGY CO., LTD

## SOT-363 Plastic-Encapsulate Transistors

**MMDT2222A** DUAL TRANSISTOR (NPN+NPN)

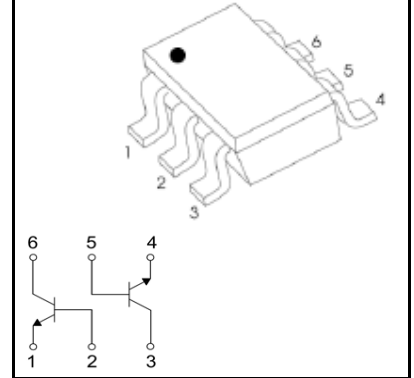
### FEATURE

Complementary PNP Type available MMDT2907A

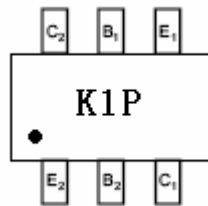
**MAXIMUM RATINGS** ( $T_a=25^{\circ}\text{C}$  unless otherwise noted)

| Symbol         | Parameter                                        | Value    | Units              |
|----------------|--------------------------------------------------|----------|--------------------|
| $V_{CBO}$      | 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                 |
| $P_C$          | Collector Power Dissipation                      | 200      | mW                 |
| $T_J, T_{stg}$ | Operation Junction and Storage Temperature Range | -55~+150 | $^{\circ}\text{C}$ |

### SOT-363



**MARKING: K1P**



# ELECTRICAL CHARACTERISTICS (Ta=25°C unless otherwise specified)

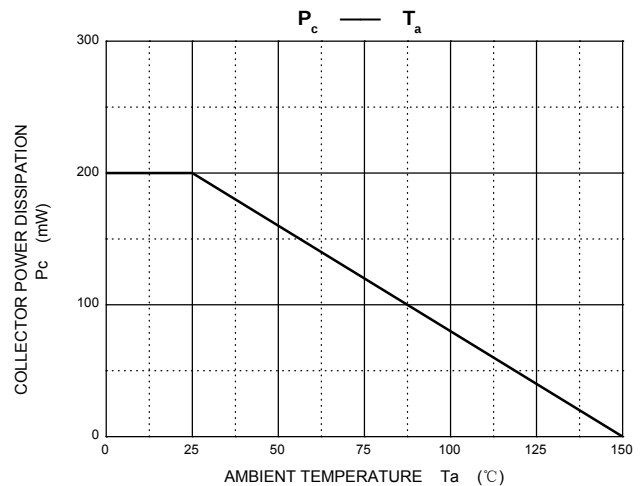
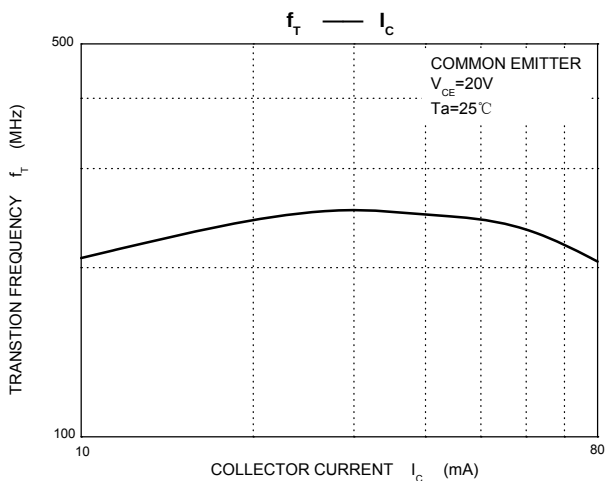
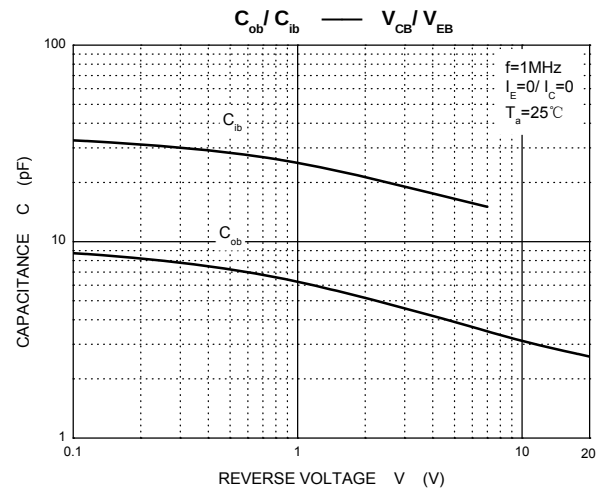
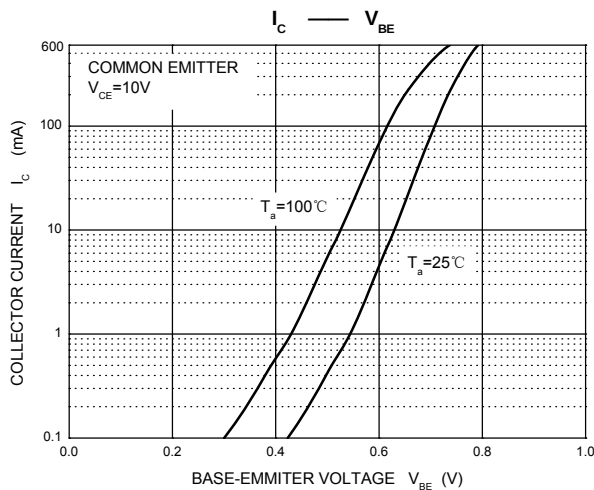
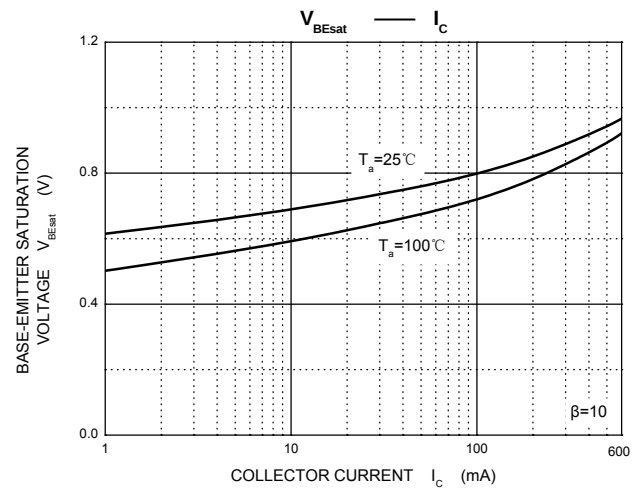
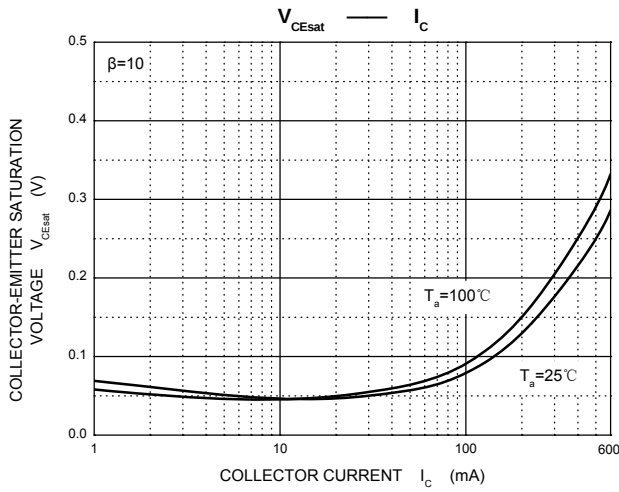
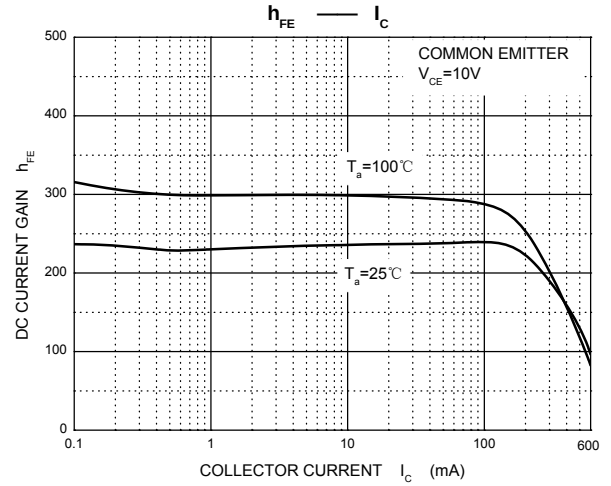
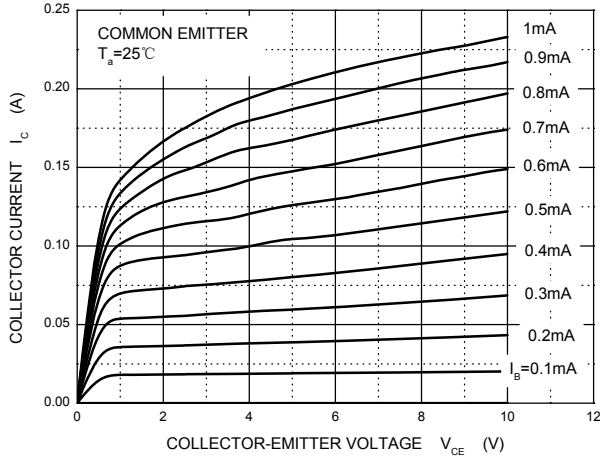
| Parameter                            | Symbol         | Test conditions                                          | Min | Max | Unit |
|--------------------------------------|----------------|----------------------------------------------------------|-----|-----|------|
| Collector-base breakdown voltage     | $V_{(BR)CBO}$  | $I_C = 10\mu A, I_E = 0$                                 | 75  |     | V    |
| Collector-emitter breakdown voltage  | $V_{(BR)CEO}$  | $I_C = 10mA, I_B = 0$                                    | 40  |     | V    |
| Emitter-base breakdown voltage       | $V_{(BR)EBO}$  | $I_E = 10\mu A, I_C = 0$                                 | 6   |     | V    |
| Collector cut-off current            | $I_{CBO}$      | $V_{CB} = 60V, I_E = 0$                                  |     | 10  | nA   |
| Collector cut-off current            | $I_{CEX}$      | $V_{CE} = 60V, V_{EB(off)} = 3V$                         |     | 10  | nA   |
| Emitter cut-off current              | $I_{EBO}$      | $V_{EB} = 3V, I_C = 0$                                   |     | 10  | nA   |
| DC current gain                      | $h_{FE(1)}$    | $V_{CE} = 10V, I_C = 0.1mA$                              | 35  |     |      |
|                                      | $h_{FE(2)}$    | $V_{CE} = 10V, I_C = 1mA$                                | 50  |     |      |
|                                      | $h_{FE(3)}$    | $V_{CE} = 10V, I_C = 10mA$                               | 75  |     |      |
|                                      | $h_{FE(4)}$    | $V_{CE} = 10V, I_C = 150mA$                              | 100 | 300 |      |
|                                      | $h_{FE(5)}$    | $V_{CE} = 10V, I_C = 500mA$                              | 40  |     |      |
|                                      | $h_{FE(6)}$    | $V_{CE} = 1V, I_C = 150mA$                               | 35  |     |      |
| Collector-emitter saturation voltage | $V_{CE(sat)1}$ | $I_C = 150mA, I_B = 15mA$                                |     | 0.3 | V    |
|                                      | $V_{CE(sat)2}$ | $I_C = 500mA, I_B = 50mA$                                |     | 1   | V    |
| Base-emitter saturation voltage      | $V_{BE(sat)1}$ | $I_C = 150mA, I_B = 15mA$                                | 0.6 | 1.2 | V    |
|                                      | $V_{BE(sat)2}$ | $I_C = 500mA, I_B = 50mA$                                |     | 2   | V    |
| Transition frequency                 | $f_T$          | $V_{CE} = 20V, I_C = 20mA, f = 100MHz$                   | 300 |     | MHz  |
| Output Capacitance                   | $C_{ob}$       | $V_{CB} = 10V, I_E = 0, f = 1MHz$                        |     | 8   | pF   |
| Input Capacitance                    | $C_{ib}$       | $V_{EB} = 0.5V, I_C = 0, f = 1MHz$                       |     | 25  | pF   |
| Noise Figure                         | NF             | $V_{CE} = 10V, I_C = 100\mu A, f = 1KHz, R_s = 1K\Omega$ |     | 4   | dB   |

## Switching characteristics

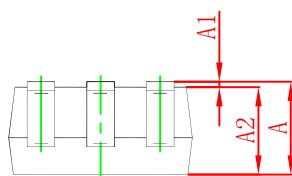
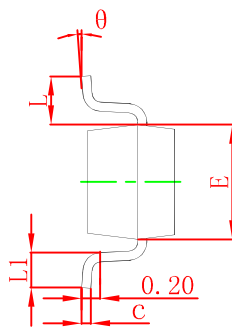
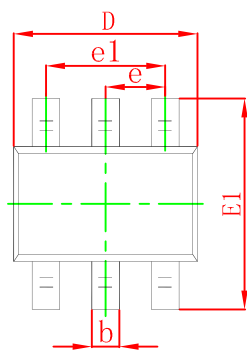
| Parameter    | Symbol | Test conditions                                                | Min | Max | Unit |
|--------------|--------|----------------------------------------------------------------|-----|-----|------|
| Delay time   | $t_d$  | $V_{CC} = 30V, I_C = 150mA, V_{BE(off)} = 0.5V, I_{B1} = 15mA$ |     | 10  | ns   |
| Rise time    | $t_r$  |                                                                |     | 25  | ns   |
| Storage time | $t_s$  | $V_{CC} = 30V, I_C = 150mA, I_{B1} = -I_{B2} = 15mA$           |     | 225 | ns   |
| Fall time    | $t_f$  |                                                                |     | 60  | ns   |

# Typical Characteristics

Static Characteristic

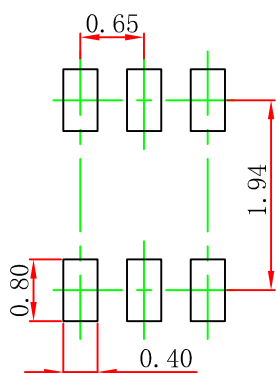


## SOT-363 Package Outline Dimensions



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min                       | Max   | Min                  | Max   |
| A      | 0.900                     | 1.100 | 0.035                | 0.043 |
| A1     | 0.000                     | 0.100 | 0.000                | 0.004 |
| A2     | 0.900                     | 1.000 | 0.035                | 0.039 |
| b      | 0.150                     | 0.350 | 0.006                | 0.014 |
| c      | 0.100                     | 0.150 | 0.004                | 0.006 |
| D      | 2.000                     | 2.200 | 0.079                | 0.087 |
| E      | 1.150                     | 1.350 | 0.045                | 0.053 |
| E1     | 2.150                     | 2.400 | 0.085                | 0.094 |
| e      | 0.650 TYP                 |       | 0.026 TYP            |       |
| e1     | 1.200                     | 1.400 | 0.047                | 0.055 |
| L      | 0.525 REF                 |       | 0.021 REF            |       |
| L1     | 0.260                     | 0.460 | 0.010                | 0.018 |
| θ      | 0°                        | 8°    | 0°                   | 8°    |

## SOT-363 Suggested Pad Layout



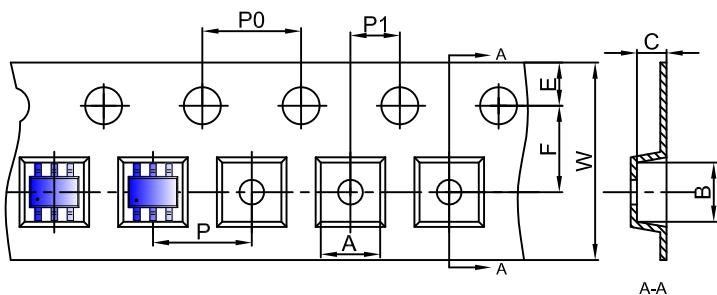
Note:

1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.05\text{mm}$ .
3. The pad layout is for reference purposes only.

### NOTICE

JSCJ reserves the right to make modifications, enhancements, improvements, corrections or other changes without further notice to any product herein. JSCJ does not assume any liability arising out of the application or use of any product described herein.

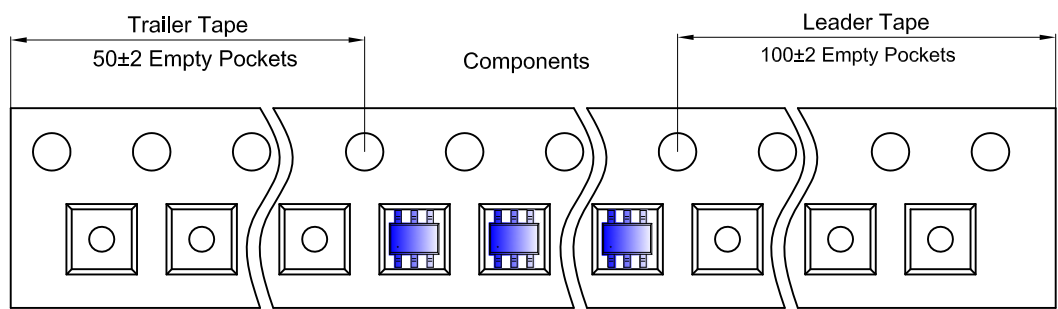
SOT-363 Embossed Carrier Tape



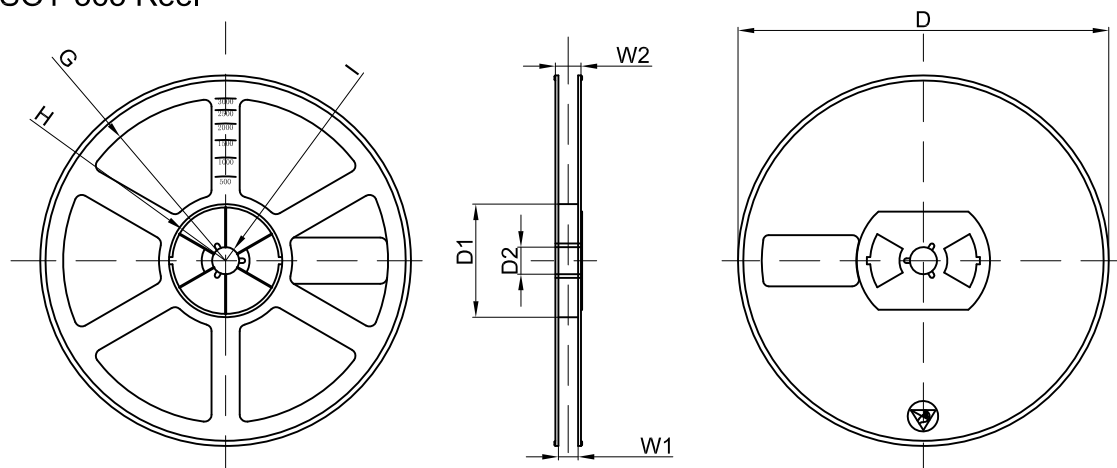
Packaging Description:  
SOT-363 parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 3,000 units per 7" or 17.8cm diameter reel. The reels are clear in color and is made of polystyrene plastic (anti-static coated).

| Dimensions are in millimeter |      |      |      |       |      |      |      |      |      |      |
|------------------------------|------|------|------|-------|------|------|------|------|------|------|
| Pkg type                     | A    | B    | C    | d     | E    | F    | P0   | P    | P1   | W    |
| SOT-363                      | 2.25 | 2.55 | 1.20 | Ø1.50 | 1.75 | 3.50 | 4.00 | 4.00 | 2.00 | 8.00 |

SOT-363 Tape Leader and Trailer



SOT-363 Reel



| Dimensions are in millimeter |         |       |       |        |        |       |      |       |
|------------------------------|---------|-------|-------|--------|--------|-------|------|-------|
| Reel Option                  | D       | D1    | D2    | G      | H      | I     | W1   | W2    |
| 7"Dia                        | Ø178.00 | 54.40 | 13.00 | R78.00 | R25.60 | R6.50 | 9.50 | 12.30 |

| REEL     | Reel Size | Box        | Box Size(mm) | Carton      | Carton Size(mm) | G.W.(kg) |
|----------|-----------|------------|--------------|-------------|-----------------|----------|
| 3000 pcs | 7 inch    | 45,000 pcs | 203×203×195  | 180,000 pcs | 438×438×220     |          |