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# 2N7002K

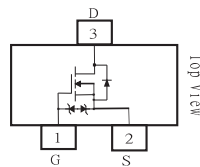
## 60V N-Channel Enhancement Mode MOSFET - ESD Protected

### FEATURES

- $R_{DS(ON)}, V_{GS}@10V, I_{DS}@500mA=3\Omega$
- $R_{DS(ON)}, V_{GS}@4.5V, I_{DS}@200mA=4\Omega$
- Advanced Trench Process Technology
- High Density Cell Design For Ultra Low On-Resistance
- Very Low Leakage Current In Off Condition
- Specially Designed for Battery Operated Systems, Solid-State Relays Drivers : Relays, Displays, Lamps, Solenoids, Memories, etc.
- ESD Protected 2KV HBM
- Lead free in comply with EU RoHS 2002/95/EC directives.
- Green molding compound as per IEC61249 Std. . (Halogen Free)

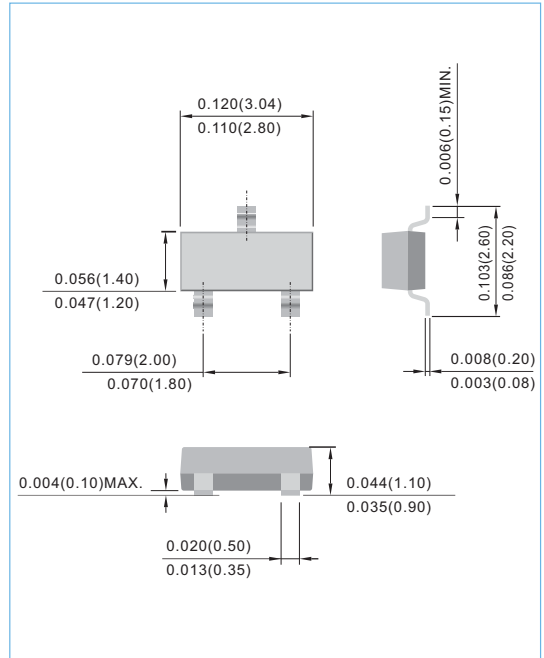
### MECHANICALDATA

- Case: SOT-23 Package
- Terminals : Solderable per MIL-STD-750,Method 2026
- Apporx. Weight: 0.0003 ounces, 0.0084 grams
- Marking : K72



### SOT-23

Unit : inch(mm)



### Maximum RATINGS and Thermal Characteristics (T<sub>A</sub>=25°C unless otherwise noted )

| PARAMETER                                                         | Symbol                            | Limit                                                  | Units |
|-------------------------------------------------------------------|-----------------------------------|--------------------------------------------------------|-------|
| Drain-Source Voltage                                              | V <sub>DS</sub>                   | 60                                                     | V     |
| Gate-Source Voltage                                               | V <sub>GS</sub>                   | ±20                                                    | V     |
| Continuous Drain Current                                          | I <sub>D</sub>                    | 300                                                    | mA    |
| Pulsed Drain Current <sup>1)</sup>                                | I <sub>DM</sub>                   | 2000                                                   | mA    |
| Maximum Power Dissipation                                         | P <sub>D</sub>                    | T <sub>A</sub> =25°C: 350<br>T <sub>A</sub> =75°C: 210 | mW    |
| Operating Junction and Storage Temperature Range                  | T <sub>J</sub> , T <sub>STG</sub> | -55 to + 150                                           | °C    |
| Junction-to Ambient Thermal Resistance(PCB mounted) <sup>2)</sup> | R <sub>θJA</sub>                  | 357                                                    | °C/W  |

- Note: 1. Maximum DC current limited by the package  
2. Surface mounted on FR4 board, t < 5 sec

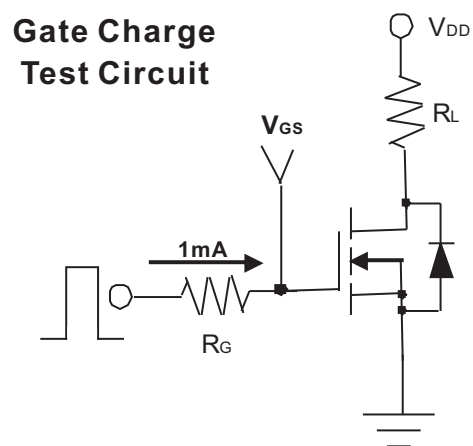
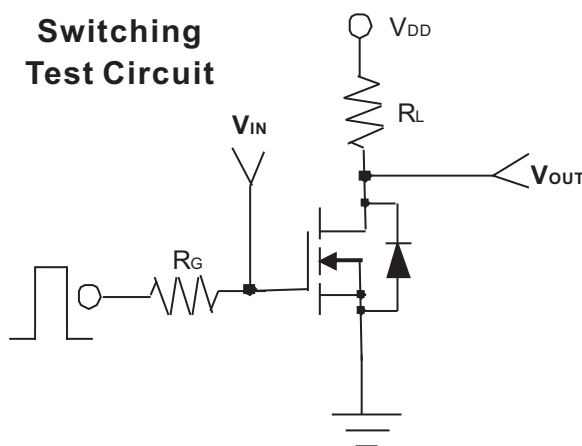
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# 2N7002K

## ELECTRICAL CHARACTERISTICS

| Parameter                        | Symbol       | Test Condition                                                            | Min. | Typ. | Max. | Units |
|----------------------------------|--------------|---------------------------------------------------------------------------|------|------|------|-------|
| <b>Static</b>                    |              |                                                                           |      |      |      |       |
| Drain-Source Breakdown Voltage   | $BV_{DSS}$   | $V_{GS}=0V, I_D=10\mu A$                                                  | 60   | -    | -    | V     |
| Gate Threshold Voltage           | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=250\mu A$                                             | 1    | -    | 2.5  | V     |
| Drain-Source On-State Resistance | $R_{DS(on)}$ | $V_{GS}=4.5V, I_D=200mA$                                                  | -    | -    | 4.0  | Ω     |
| Drain-Source On-State Resistance | $R_{DS(on)}$ | $V_{GS}=10V, I_D=500mA$                                                   | -    | -    | 3.0  |       |
| Zero Gate Voltage Drain Current  | $I_{DSS}$    | $V_{DS}=60V, V_{GS}=0V$                                                   | -    | -    | 1    | μA    |
| Gate Body Leakage                | $I_{GSS}$    | $V_{GS}=\pm 20V, V_{DS}=0V$                                               | -    | -    | ±10  | μA    |
| Forward Transconductance         | $g_{fs}$     | $V_{DS}=15V, I_D=250mA$                                                   | 100  | -    | -    | mS    |
| <b>Dynamic</b>                   |              |                                                                           |      |      |      |       |
| Total Gate Charge                | $Q_g$        | $V_{DS}=15V, I_D=200mA$<br>$V_{GS}=5V$                                    | -    | -    | 0.8  | nC    |
| Turn-On Time                     | $t_{on}$     | $V_{DD}=30V, R_L=150\Omega$<br>$I_D=200mA, V_{GEN}=10V$<br>$R_G=10\Omega$ | -    | -    | 20   | ns    |
| Turn-Off Time                    | $t_{off}$    |                                                                           | -    | -    | 40   |       |
| Input Capacitance                | $C_{iss}$    | $V_{DS}=25V, V_{GS}=0V$<br>$f=1.0MHz$                                     | -    | -    | 35   | pF    |
| Output Capacitance               | $C_{oss}$    |                                                                           | -    | -    | 10   |       |
| Reverse Transfer Capacitance     | $C_{rss}$    |                                                                           | -    | -    | 5    |       |
| <b>Source-Drain Diode</b>        |              |                                                                           |      |      |      |       |
| Diode Forward Voltage            | $V_{SD}$     | $I_S=200mA, V_{GS}=0V$                                                    | -    | 0.82 | 1.3  | V     |
| Continuous Diode Forward Current | $I_S$        | -                                                                         | -    | -    | 300  | mA    |
| Pulse Diode Forward Current      | $I_{SM}$     | -                                                                         | -    | -    | 2000 | mA    |





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Typical Characteristics Curves ( $T_A=25^\circ\text{C}$ , unless otherwise noted)

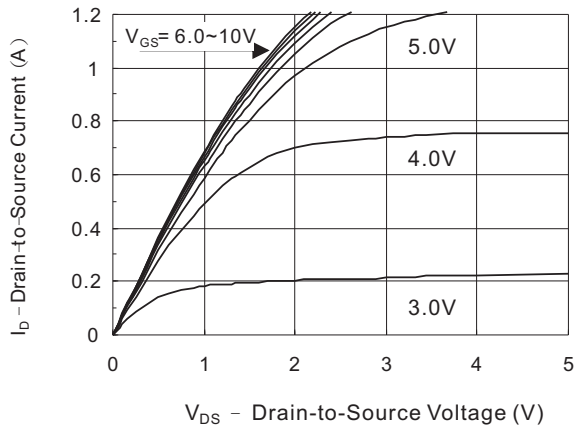


FIG.1- Output Characteristic

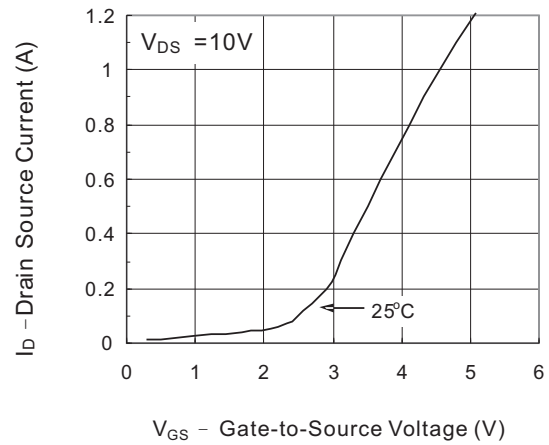


FIG.2- Transfer Characteristic

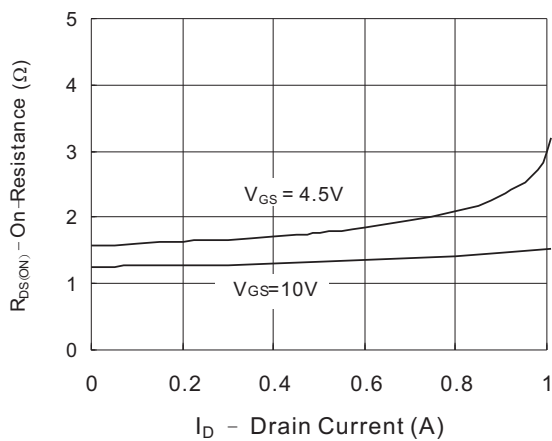


FIG.3- On Resistance vs Drain Current

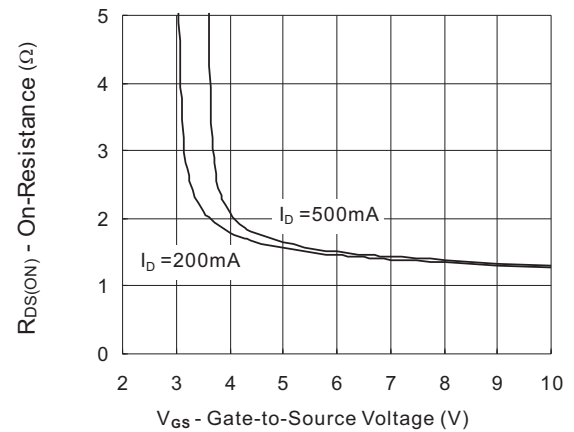


FIG.4- On Resistance vs Gate to Source Voltage

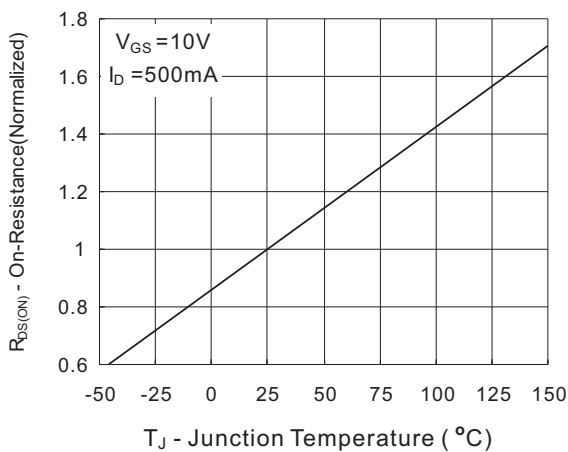


FIG.5- On Resistance vs Junction Temperature



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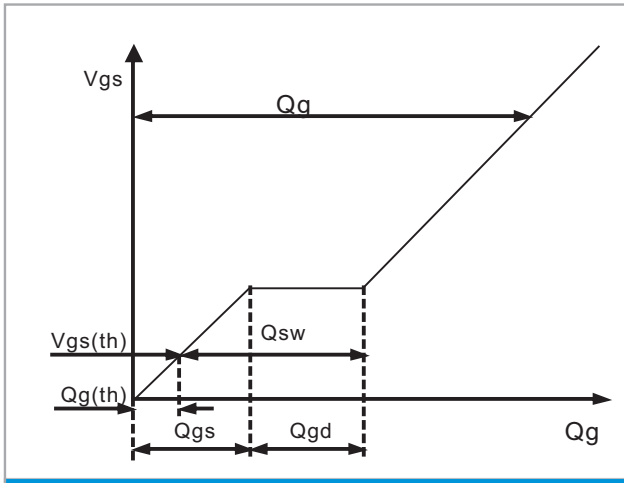


Fig. 6 - Gate Charge Waveform

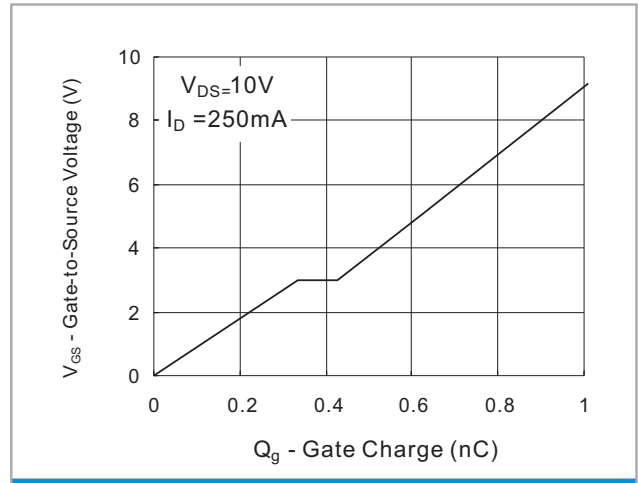


Fig. 7 - Gate Charge

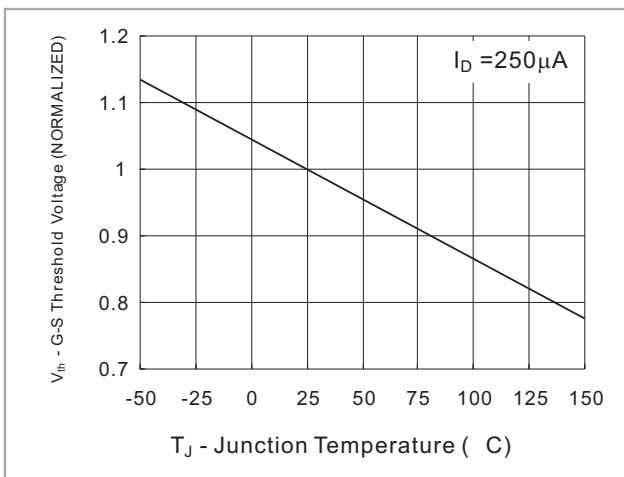


Fig. 8 - Threshold Voltage vs Temperature

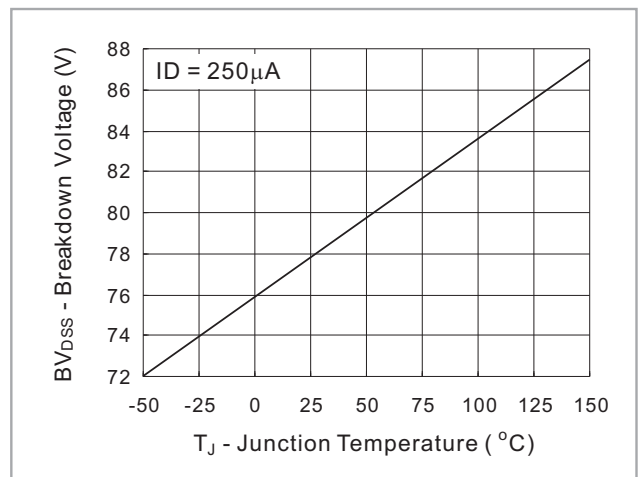


Fig. 9 - Breakdown Voltage vs Junction Temperature

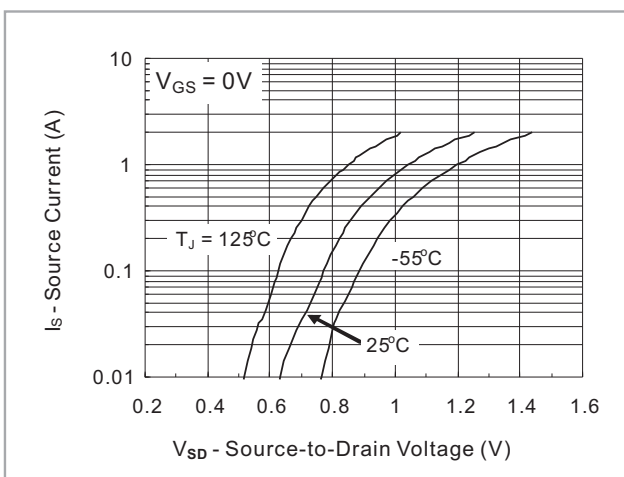


Fig. 10 - Source-Drain Diode Forward Voltage

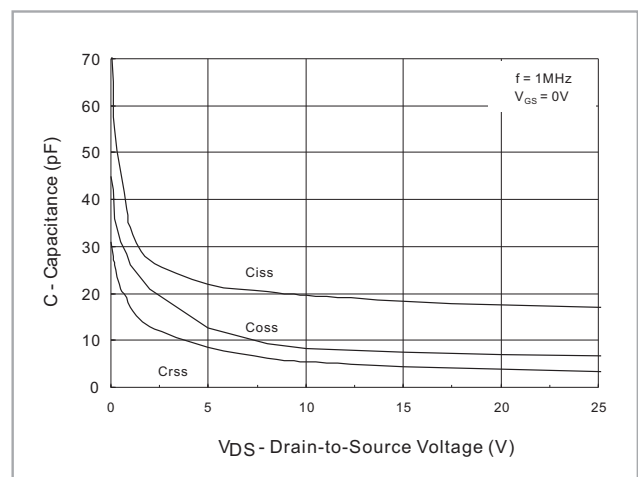
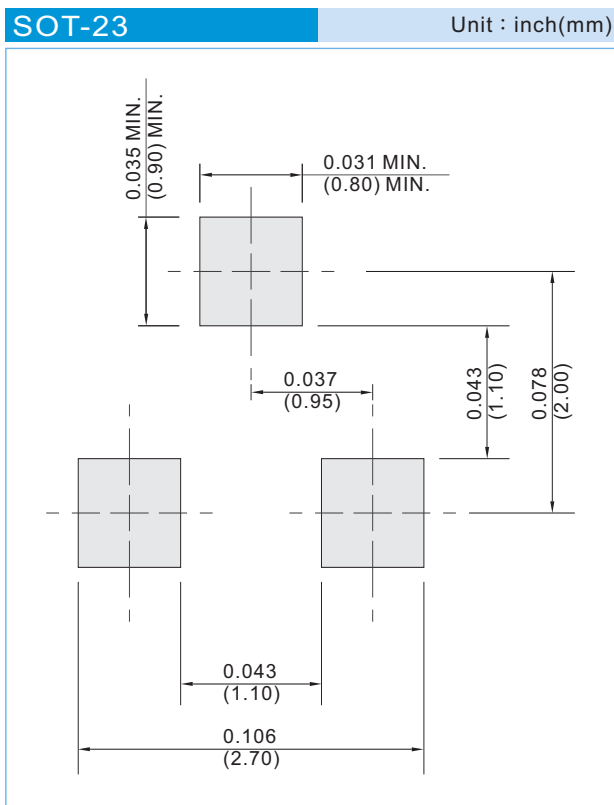


Fig. 11 - Capacitance vs Drain to Source Voltage



# 2N7002K

## MOUNTING PAD LAYOUT



### ORDER INFORMATION

- Packing information  
T/R - 12K per 13" plastic Reel  
T/R - 3K per 7" plastic Reel

### LEGAL STATEMENT

#### Copyright PanJit International, Inc 2012

The information presented in this document is believed to be accurate and reliable. The specifications and information herein are subject to change without notice. Pan Jit makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose. Pan Jit products are not authorized for use in life support devices or systems. Pan Jit does not convey any license under its patent rights or rights of others.

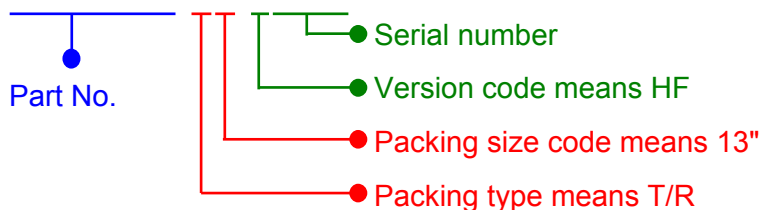


# 2N7002K

## Part No\_packing code\_Version

For example :

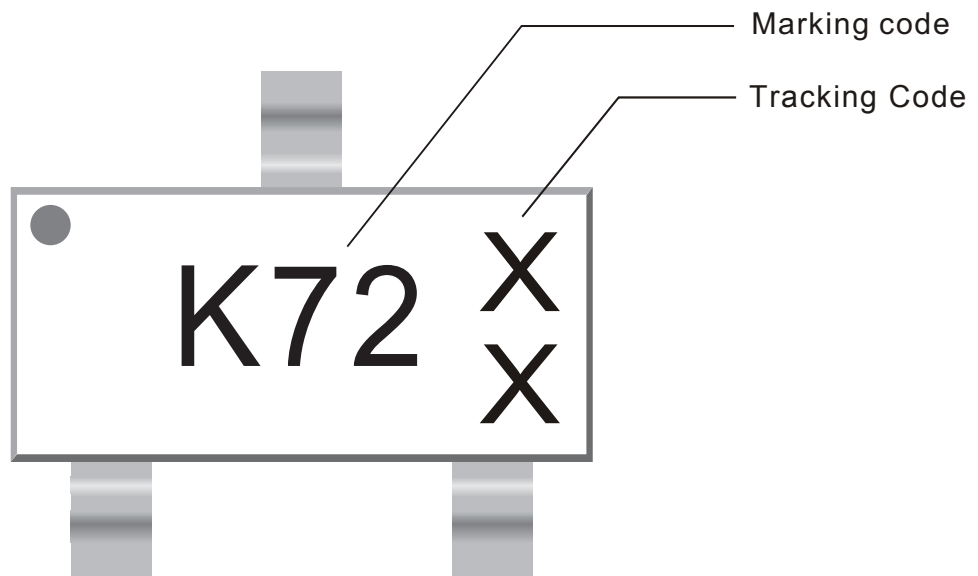
**RB500V-40\_R2\_00001**



| Packing Code <b>XX</b> |                      |                   |                      | Version Code <b>XXXXX</b> |                      |                                       |
|------------------------|----------------------|-------------------|----------------------|---------------------------|----------------------|---------------------------------------|
| Packing type           | 1 <sup>st</sup> Code | Packing size code | 2 <sup>nd</sup> Code | HF or RoHS                | 1 <sup>st</sup> Code | 2 <sup>nd</sup> ~5 <sup>th</sup> Code |
| T/B                    | <b>A</b>             | N/A               | <b>0</b>             | HF                        | <b>0</b>             | <b>serial number</b>                  |
| T/R                    | <b>R</b>             | 7"                | <b>1</b>             | RoHS                      | <b>1</b>             | <b>serial number</b>                  |
| B/P                    | <b>B</b>             | 13"               | <b>2</b>             |                           |                      |                                       |
| T/P                    | <b>T</b>             | 26mm              | <b>X</b>             |                           |                      |                                       |
| TRR                    | <b>S</b>             | 52mm              | <b>Y</b>             |                           |                      |                                       |
| TRL                    | <b>L</b>             | PBCU              | <b>U</b>             |                           |                      |                                       |
| FORMING                | <b>F</b>             | PBCD              | <b>D</b>             |                           |                      |                                       |



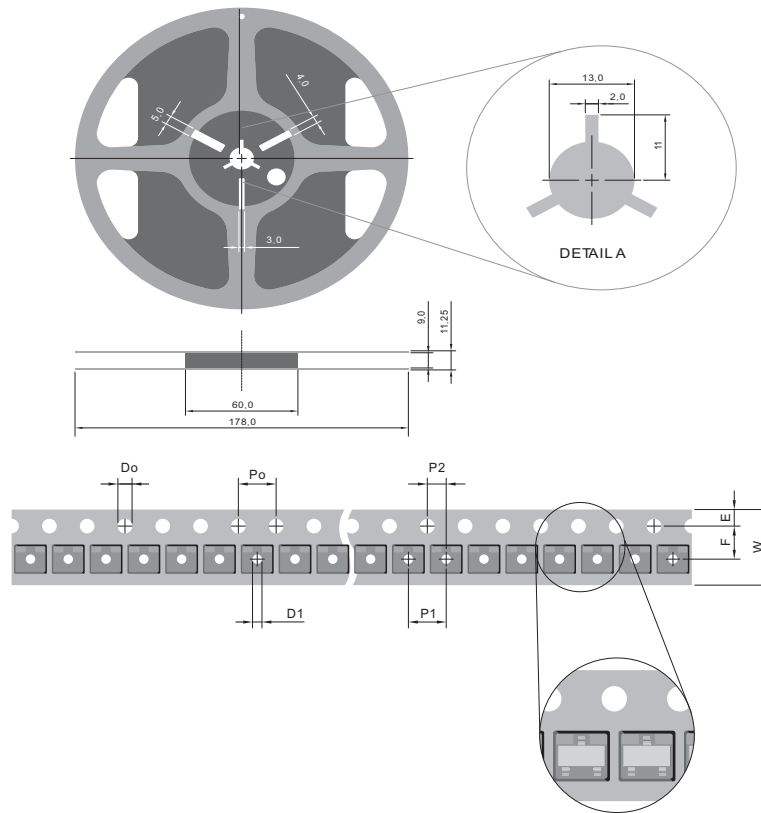
## 2. MARKING







### 3. TAPING



| SYMBOL    | mm (inch)                                    |
|-----------|----------------------------------------------|
| TYPE SIZE | 8.00 (0.315)                                 |
| D0        | 1.50 ± 0.10(0.059 ± 0.004)                   |
| D1        | 1.00 ± 0.25(0.039 ± 0.010)                   |
| E         | 1.75 ± 0.10(0.069 ± 0.004)                   |
| F         | 3.50 + 0.05(0.137 ± 0.002)                   |
| Po        | 4.00 ± 0.10(0.157 ± 0.004)                   |
| P1        | 4.00 ± 0.10(0.157 ± 0.004)                   |
| P2        | 2.00 ± 0.05(0.009 ± 0.002)                   |
| W         | 8.00 + 0.3 (0.315 + 0.012)<br>- 0.15 - 0.006 |

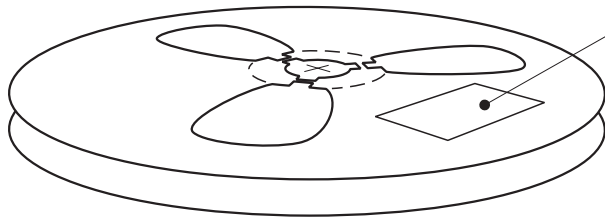
**NOTE:**

1. There shall be leader of 230 mm minimum which may consist of carrier and or cover tape follower by a minimum of 160 mm of carrier tape sealed with cover tape.
2. There shall be minimum of 160 mm of empty component pockets sealed with cover tape.
3. Devices are packed in accordance with EIA standard EIA-481-A and specifications given above.



## 4. PACKING

### REEL PACKING

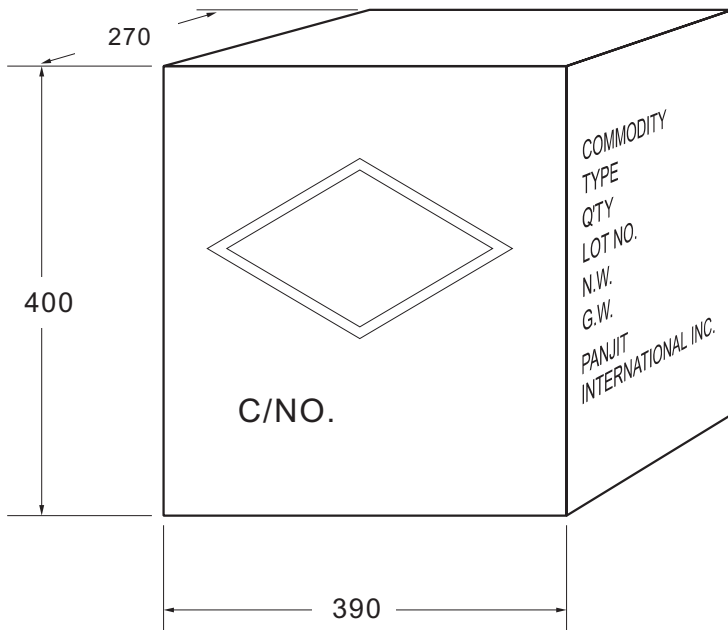


Quantity per Reel: 3,000 pcs

#### LABEL TYPE

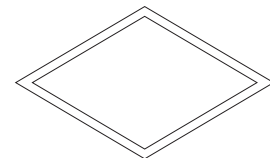
|          |     |         |
|----------|-----|---------|
| TYPE:    |     | PANJIT  |
| MARKING: |     |         |
| PART NO: |     |         |
| LOT NO:  |     |         |
| QTY:     | DC: | HF RoHS |

### CARTON



Box Dimensions : mm  
Quantity per Box: 240,000pcs

#### SHIPPING MARK



C/NO.  
PRODUCT COUNTRY

#### SIDE MARK

COMMODITY:  
TYPE:  
Q'TY:  
LOT NO.  
N.W.  
G.W.  
PANJIT  
INTERNATIONAL INC.



# Packing Specifications

| Package             | Reel Size | Reel   | Component Space | Tape Space | Reel Dia | Carton Size     | Carton  | Approx. Gross Weight |
|---------------------|-----------|--------|-----------------|------------|----------|-----------------|---------|----------------------|
|                     | (inch)    | (pcs)  | (m/m)           | (m/m)      | (m/m)    | (m/m)           | (EA)    | (Kg)                 |
| <b>Reel Packing</b> |           |        |                 |            |          |                 |         |                      |
| DFN 2L              | 7         | 8,000  | 2               | 8          | 178      | 390 x 270 x 400 | 640,000 | 8.6                  |
| DFN 3L              | 7         | 8,000  | 2               | 8          | 178      | 390 x 270 x 400 | 640,000 | 8.6                  |
| SOD-123             | 7         | 3,000  | 4               | 8          | 178      | 390 x 270 x 400 | 240,000 | 9.9                  |
|                     | 13        | 10,000 | 4               | 8          | 330      | 375 x 360 x 213 | 120,000 | 6.5                  |
| SOD-123FL           | 7         | 3,000  | 4               | 8          | 178      | 390 x 270 x 400 | 240,000 | 10.6                 |
|                     | 13        | 10,000 | 4               | 8          | 330      | 375 x 360 x 213 | 120,000 | 7.2                  |
| SOD-123HE           | 7         | 3,000  | 4               | 8          | 178      | 390 x 270 x 400 | 240,000 | 12.4                 |
|                     | 13        | 10,000 | 4               | 8          | 330      | 375 x 360 x 213 | 120,000 | 8.1                  |
| SOD-323             | 7         | 5,000  | 4               | 8          | 178      | 390 x 270 x 400 | 400,000 | 9.4                  |
|                     | 13        | 12,000 | 4               | 8          | 330      | 375 x 360 x 213 | 144,000 | 5.9                  |
| SOD-323HE           | 7         | 5,000  | 4               | 8          | 178      | 390 x 270 x 400 | 400,000 | 11.9                 |
|                     | 13        | 12,000 | 4               | 8          | 178      | 375 x 360 x 213 | 144,000 | 8.3                  |
| SOD-523             | 7         | 5,000  | 4               | 8          | 178      | 390 x 270 x 400 | 400,000 | 9.1                  |
|                     | 13        | 12,000 | 4               | 8          | 330      | 375 x 360 x 213 | 144,000 | 5.4                  |
| SOD-723             | 7         | 8,000  | 2               | 8          | 178      | 390 x 270 x 400 | 640,000 | 8.5                  |
| SOD-923             | 7         | 8,000  | 2               | 8          | 178      | 390 x 270 x 400 | 640,000 | 7.7                  |
| SOT-23              | 7         | 3,000  | 4               | 8          | 178      | 390 x 270 x 400 | 240,000 | 9.8                  |
|                     | 13        | 12,000 | 4               | 8          | 330      | 375 x 360 x 213 | 144,000 | 7                    |
| SOT-23 (ESD)        | 7         | 3,000  | 4               | 8          | 178      | 455 x 270 x 440 | 240,000 | 9.9                  |
| SOT-23 5L           | 7         | 3,000  | 4               | 8          | 178      | 390 x 270 x 400 | 240,000 | 14.5                 |
|                     | 13        | 10,000 | 4               | 8          | 330      | 375 x 360 x 213 | 120,000 | 7.9                  |
| SOT-23 6L           | 7         | 3,000  | 4               | 8          | 178      | 390 x 270 x 400 | 240,000 | 14.5                 |
|                     | 13        | 10,000 | 4               | 8          | 330      | 375 x 360 x 213 | 120,000 | 7.9                  |
| SOT-323             | 7         | 3,000  | 4               | 8          | 178      | 390 x 270 x 400 | 240,000 | 7.9                  |
|                     | 13        | 12,000 | 4               | 8          | 330      | 375 x 360 x 213 | 144,000 | 6.1                  |
| SOT-323 (ESD)       | 7         | 3,000  | 4               | 8          | 178      | 455 x 270 x 440 | 240,000 | 9.4                  |
| SOT-353             | 7         | 3,000  | 4               | 8          | 178      | 390 x 270 x 400 | 240,000 | 10                   |
|                     | 13        | 10,000 | 4               | 8          | 330      | 375 x 360 x 213 | 120,000 | 7.2                  |
| SOT-363             | 7         | 3,000  | 4               | 8          | 178      | 390 x 270 x 400 | 240,000 | 10.2                 |
|                     | 13        | 10,000 | 4               | 8          | 330      | 375 x 360 x 213 | 120,000 | 7.1                  |
| SOT-363 (ESD)       | 7         | 3,000  | 4               | 8          | 178      | 455 x 270 x 440 | 240,000 | 10                   |
| SOT-523             | 7         | 4,000  | 4               | 8          | 178      | 390 x 270 x 400 | 320,000 | 10                   |
| SOT-543             | 7         | 4,000  | 4               | 8          | 178      | 390 x 270 x 400 | 320,000 | 9.4                  |
|                     | 13        | 10,000 | 4               | 8          | 330      | 375 x 360 x 213 | 120,000 | 5.2                  |
| SOT-553             | 7         | 4,000  | 4               | 8          | 178      | 390 x 270 x 400 | 320,000 | 9.4                  |
|                     | 13        | 10,000 | 4               | 8          | 330      | 375 x 360 x 213 | 120,000 | 5.2                  |
| SOT-563             | 7         | 4,000  | 4               | 8          | 178      | 390 x 270 x 400 | 320,000 | 9.4                  |
|                     | 13        | 10,000 | 4               | 8          | 330      | 375 x 360 x 213 | 120,000 | 5.2                  |



## Packing Specifications

| Package                   | Reel Size | Reel   | Component Space | Tape Space | Reel Dia | Carton Size     | Carton  | Approx. Gross Weight |
|---------------------------|-----------|--------|-----------------|------------|----------|-----------------|---------|----------------------|
|                           | (inch)    | (pcs)  | (m/m)           | (m/m)      | (m/m)    | (m/m)           | (EA)    | (Kg)                 |
| <b>Reel Packing</b>       |           |        |                 |            |          |                 |         |                      |
| A-405                     | 13        | 5,000  | 5               | 52         | 330      | 340 x 340 x 410 | 25,000  | 7.79                 |
| DO-15                     | 13        | 4,000  | 5               | 52         | 330      | 340 x 340 x 410 | 20,000  | 11.4                 |
| DO-201AD                  | 13        | 1,250  | 10              | 52         | 330      | 340 x 340 x 410 | 6,250   | 9.2                  |
| DO-201AE                  | 13        | 1,250  | 10              | 52         | 330      | 340 x 340 x 410 | 6,250   | 9.2                  |
| DO-34                     | 15        | 10,000 | 5               | 52         | 360      | 360 x 360 x 395 | 50,000  | 10.1                 |
| DO-35                     | 15        | 10,000 | 5               | 52         | 360      | 360 x 360 x 395 | 50,000  | 11.2                 |
| DO-41                     | 13        | 5,000  | 5               | 52         | 330      | 340 x 340 x 410 | 25,000  | 11                   |
| DO-41G                    | 15        | 5,000  | 5               | 52         | 360      | 360 x 360 x 395 | 25,000  | 10.9                 |
| MDI                       | 13        | 3,000  | 8               | 12         | 330      | 375 x 360 x 390 | 48,000  | 14.7                 |
| MELF/DL-41                | 7         | 1,500  | 4               | -          | 178      | 385 x 380 x 260 | 84,000  | 18.3                 |
|                           | 13        | 5,000  | 4               | -          | 330      | 360 x 360 x 395 | 100,000 | 23.5                 |
| MICRO-MELF                | 7         | 2,500  | 4               | -          | 178      | 385 x 380 x 260 | 200,000 | 9.3                  |
|                           | 13        | 10,000 | 4               | -          | 330      | 360 x 360 x 395 | 200,000 | 11.5                 |
| MINI-MELF/LL-34           | 7         | 2,500  | 4               | -          | 178      | 385 x 380 x 260 | 200,000 | 12.7                 |
|                           | 13        | 10,000 | 4               | -          | 330      | 360 x 360 x 395 | 200,000 | 14.6                 |
| MICRO DIP/TDI             | 7         | 1,000  | 8               | 12         | 178      | 390 x 240 x 420 | 40,000  | 9.5                  |
|                           | 13        | 4,000  | 8               | 12         | 330      | 375 x 360 x 390 | 64,000  | 17                   |
| P-600                     | 13        | 800    | 10              | 52         | 330      | 340 x 340 x 410 | 4,000   | 9.9                  |
| QUADRO-MELF               | 13        | 10,000 | 4               | -          | 330      | 360 x 360 x 395 | 200,000 | 14.9                 |
|                           | 7         | 2,500  | 4               | -          | 178      | 385 x 380 x 260 | 200,000 | 13.3                 |
| R-1                       | 13        | 5,000  | 5               | 52         | 330      | 340 x 340 x 410 | 25,000  | 7.8                  |
| SDIP                      | 13        | 1,500  | 12              | 16         | 330      | 375 x 360 x 390 | 21,000  | 14.3                 |
| SMA(W)                    | 7         | 1,800  | 4               | 12         | 178      | 390 x 240 x 420 | 100,800 | 13                   |
|                           | 13        | 7,500  | 4               | 12         | 330      | 355 x 355 x 400 | 150,000 | 20.4                 |
| SMA/DO-214AC              | 7         | 1,800  | 4               | 12         | 178      | 390 x 240 x 420 | 72,000  | 10                   |
|                           | 13        | 7,500  | 4               | 12         | 330      | 375 x 360 x 390 | 120,000 | 17.4                 |
| SMB/DO-214AA              | 7         | 500    | 8               | 12         | 178      | 390 x 240 x 420 | 20,000  | 6.5                  |
|                           | 13        | 3,000  | 8               | 12         | 330      | 375 x 360 x 390 | 48,000  | 13.2                 |
| SMC/DO-214AB              | 7         | 500    | 8               | 16         | 178      | 390 x 240 x 420 | 15,000  | 8.4                  |
|                           | 13        | 3,000  | 8               | 16         | 330      | 375 x 360 x 390 | 42,000  | 18                   |
| TO-252/DPAK               | 13        | 3,000  | 8               | 16         | 330      | 375 x 360 x 390 | 42,000  | 18.8                 |
| TO-263/D <sup>2</sup> PAK | 13        | 800    | 16              | 24         | 330      | 375 x 360 x 390 | 6,400   | 14.5                 |
| TO-277                    | 13        | 5,000  | 8               | 12         | 330      | 375 x 360 x 390 | 80,000  | 20.6                 |



## Packing Specifications

| Package             | Inner Box Size | Box   | Carton Size     | Carton  | Approx. Gross Weight |
|---------------------|----------------|-------|-----------------|---------|----------------------|
|                     | (m/m)          | (EA)  | (m/m)           | (EA)    | (Kg)                 |
| <b>Bulk Packing</b> |                |       |                 |         |                      |
| A-405               | 198 x 84 x 20  | 1,000 | 459 x 214 x 256 | 50,000  | 12.7                 |
| DO-15               | 200 x 85 x 25  | 1,000 | 459 x 214 x 256 | 40,000  | 20.7                 |
| DO-201AD            | 200 x 85 x 40  | 500   | 459 x 214 x 256 | 12,500  | 16                   |
| DO-201AE            | 200 x 85 x 40  | 500   | 495 x 214 x 256 | 12,500  | 16                   |
| DO-34               | 240 x 100 x 90 | 2,000 | 406 x 335 x 257 | 120,000 | 14.5                 |
| DO-35               | 240 x 100 x 90 | 2,000 | 406 x 335 x 257 | 120,000 | 17.1                 |
| DO-41               | 198 x 84 x 20  | 1,000 | 459 x 214 x 256 | 50,000  | 19.3                 |
| DO-41G              | 240 x 100 x 90 | 1,000 | 406 x 335 x 257 | 60,000  | 18.5                 |
| DIP                 | -              | -     | 459 x 214 x 256 | 12,000  | 6.5                  |
| SDIP                | -              | -     | 459 x 214 x 256 | 24,000  | 15.7                 |
| R-1                 | 198 x 84 x 20  | 1,000 | 459 x 214 x 256 | 50,000  | 12.7                 |
| P-600               | 208 x 90 x 83  | 500   | 459 x 214 x 256 | 5,000   | 11.3                 |
| ITO-220             | 540 x 145 x 85 | 2,000 | 555 x 306 x 200 | 8,000   | 20.5                 |
| TO-220              | 540 x 145 x 85 | 2,000 | 555 x 306 x 200 | 8,000   | 22.9                 |
| TO-251AB/DPAK       | 555 x 145 x 95 | 8,400 | 572 x 306 x 218 | 33,600  | 22                   |
| TO-3P/TO-247AD      | -              | -     | 530 x 243 x 100 | 1,500   | 13.9                 |
| TO-3PS/TO-247S      | -              | -     | 511 x 243 x 107 | 1,500   | 12.2                 |

| Package                   | Inner Box Size | Ammo  | Component Space | Tape Space | Carton Size     | Carton  | Approx. Gross Weight |
|---------------------------|----------------|-------|-----------------|------------|-----------------|---------|----------------------|
|                           | (m/m)          | (pcs) | (m/m)           | (m/m)      | (m/m)           | (EA)    | (Kg)                 |
| <b>Ammunition Packing</b> |                |       |                 |            |                 |         |                      |
| A-405                     | 255 x 47 x 150 | 5,000 | 5               | 26         | 339 x 276 x 330 | 60,000  | 12.4                 |
| A-405                     | 255 x 75 x 150 | 5,000 | 5               | 52         | 339 x 276 x 330 | 40,000  | 16                   |
| DO-15                     | 255 x 75 x 150 | 3,000 | 5               | 52         | 339 x 276 x 330 | 24,000  | 13.3                 |
| DO-201AD                  | 255 x 47 x 122 | 1,250 | 10              | 52         | 339 x 276 x 330 | 10,000  | 13.4                 |
| DO-201AE                  | 255 x 47 x 122 | 1,250 | 10              | 52         | 339 x 276 x 330 | 10,000  | 13.4                 |
| DO-34                     | 248 x 80 x 48  | 5,000 | 5               | 26         | 406 x 335 x 257 | 150,000 | 14.5                 |
| DO-34                     | 248 x 80 x 75  | 5,000 | 5               | 52         | 406 x 335 x 257 | 100,000 | 12.7                 |
| DO-35                     | 248 x 80 x 48  | 5,000 | 5               | 26         | 406 x 335 x 257 | 150,000 | 16.7                 |
| DO-35                     | 248 x 80 x 75  | 5,000 | 5               | 52         | 406 x 335 x 257 | 100,000 | 15.2                 |
| DO-41                     | 255 x 75 x 150 | 5,000 | 5               | 52         | 339 x 276 x 330 | 40,000  | 15.9                 |
| DO-41G                    | 248 x 80 x 48  | 2,500 | 5               | 26         | 406 x 335 x 257 | 75,000  | 17.1                 |
| DO-41G                    | 248 x 80 x 75  | 2,500 | 5               | 52         | 406 x 335 x 257 | 50,000  | 15.6                 |
| P-600                     | 255 x 47 x 122 | 400   | 10              | 52         | 339 x 276 x 330 | 3,200   | 8.1                  |
| R-1                       | 255 x 47 x 73  | 3,000 | 5               | 26         | 310 x 268 x 170 | 36,000  | 6.3                  |
| R-1                       | 255 x 73 x 73  | 3,000 | 5               | 52         | 310 x 268 x 170 | 24,000  | 6.3                  |
| R-1                       | 255 x 73 x 122 | 5,000 | 5               | 52         | 339 x 276 x 274 | 40,000  | 10.3                 |

# 5.HIGH RELIABILITY TEST SPEC (MOSFET、TRANSISTORS)

Date : 2010.07.05 rev.01

| NO. | TEST ITEM                                           | TEST CONDITION                                                                                                                                                          | REFERENCED DOCUMENT                          | LOT QUALITY LEVEL                                    |
|-----|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|------------------------------------------------------|
| 1   | TEMPERATURE CYCLING (T.C.T)<br>溫度循環試驗               | Ta = -55+0°C / -10°C 10min(Min)<br>Ta = +150+15°C / -0°C 10min(Min)<br>FOR 20CYCLES                                                                                     | MIL-STD-750D<br>METHOD-1051.5<br>Condition G | LTPD 10<br>S.S=22<br>ACCEPT FOR 0<br>FAILURE ONLY.   |
| 2   | HIGH TEMPERATURE STORAGE LIFE (H.T.S.L)<br>高溫儲存壽命試驗 | Ta=Storage Temperature Range<br>(device specified maximum temperature)                                                                                                  | MIL-STD-750D<br>METHOD-1032.2                | LTPD 10<br>S.S = 22<br>ACCEPT FOR 0<br>FAILURE ONLY. |
| 3   | SOLDERABILITY TEST<br>錫錫性試驗                         | Temperature of Solder<br>TEMPERATURE OF SOLDER POT=245 +/- 5°C<br>TIME FOR DIPPING IN SOLDER=5 +/- 0.5 SEC<br>DIPPING DEPTH=0.05inch max from the body<br>FOR ONE CYCLE | MIL-STD-750D<br>METHOD-2026.10               | LTPD 7<br>S.S=32<br>ACCEPT FOR 0<br>FAILURE ONLY.    |
| 4   | HIGH TEMPERATURE REVERSE BIAS (H.T.R.B)<br>高溫逆向偏壓   | Tj ≤ Tj max<br>VR=0.8VR(CUSTOMER SPEC.) DC supply                                                                                                                       | MIL-STD-750D<br>METHOD-1038.3                | LTPD 10<br>S.S=22<br>ACCEPT FOR 0<br>FAILURE ONLY.   |
| 5   | THERMAL SHOCK (T.S.T)<br>冷熱衝擊試驗                     | HOT TANK Ta=100+10/-2°C t= 5min<br>COLD TANK Ta=0+2/-10°C t= 5min<br>15 CYCLES<br>TIME BETWEEN TRANSFERRING<br>DO NOT EXCEED 10 SEC                                     | MIL-STD-750D<br>METHOD 1056.7                | LTPD 10<br>S.S=22<br>ACCEPT FOR 0<br>FAILURE ONLY.   |
| 6   | PRESSURE COOKER (P.C.T)<br>壓力鍋試驗                    | Ta=121°C<br>P=29.7psia / 205kPa or 2.088kg/cm <sup>2</sup><br>Relative Humidity = 100%                                                                                  | JEDEC<br>JESD22-A102-C                       | LTPD 10<br>S.S=22<br>ACCEPT FOR 0<br>FAILURE ONLY.   |
| 7   | HUMIDITY<br>恆溫濕試驗                                   | Ta=85+/-2°C<br>RH=85+/-5%                                                                                                                                               | EIAJ ED-4701<br>METHOD 103                   | LTPD 10<br>S.S=22<br>ACCEPT FOR 0<br>FAILURE ONLY.   |
| 8   | SOLDER RESISTANCE<br>錫錫耐熱性試驗                        | TEMPERATURE OF SOLDER POT=260 +/- 5°C<br>TIME FOR DIPPING IN SOLDER=10 + 2/-0 SEC<br>DIPPING DEPTH=1.57 +/- 0.79mm<br>FROM THE BODY<br>FOR ONE CYCLE                    | MIL-STD-750D<br>METHOD 2031.2                | LTPD 10<br>S.S=22<br>ACCEPT FOR 0<br>FAILURE ONLY.   |

APPROVE SHEET ISSUE DATE : December 19,2011

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