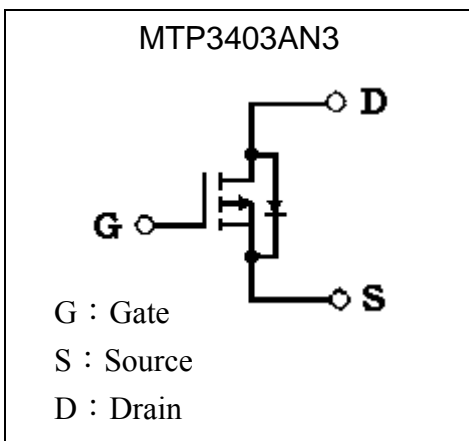
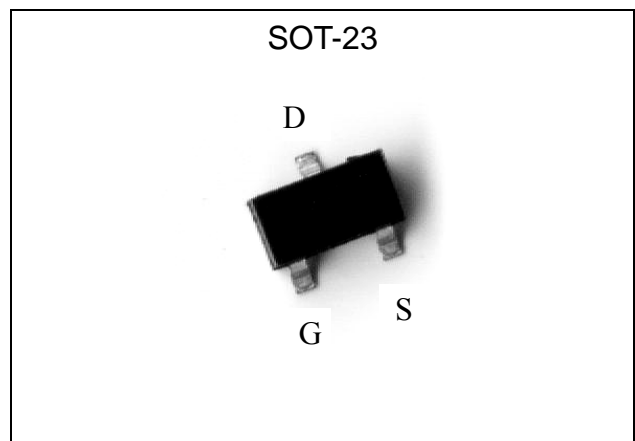


**P-CHANNEL Enhancement Mode MOSFET**

# MTP3403AN3

**Features**

- $V_{DS} = -30V$   
 $R_{DS(ON)} = 85m\Omega @ V_{GS} = -4.5V, I_{DS} = -2A$   
 $R_{DS(ON)} = 120m\Omega @ V_{GS} = -2.5V, I_{DS} = -1A$
- Advanced trench process technology
- High density cell design for ultra low on resistance
- Low gate charge
- Compact and low profile SOT-23 package
- Pb-free package

**Equivalent Circuit**

**Outline**

**Absolute Maximum Ratings (Ta=25°C)**

| Parameter  | Symbol         | Limits   | Unit |
|--|----------------|----------|------|
| Drain-Source Voltage                                 | $V_{DS}$       | -30      | V    |
| Gate-Source Voltage                                  | $V_{GS}$       | $\pm 12$ | V    |
| Continuous Drain Current @ $T_A=25^\circ C$ (Note 1) | $I_D$          | -3.2     | A    |
| Continuous Drain Current @ $T_A=70^\circ C$ (Note 1) | $I_D$          | -2.6     | A    |
| Pulsed Drain Current (Note 2)                        | $I_{DM}$       | -10      | A    |
| Maximum Power Dissipation                            | $P_D$          | 1.38     | W    |
| Linear Derating Factor                               |                | 0.01     | W/°C |
| Operating Junction and Storage Temperature           | $T_j, T_{stg}$ | -55~+150 | °C   |

Note : 1. Surface mounted on 1 in<sup>2</sup> copper pad of FR-4 board, 270°C/W when mounted on minimum copper pad.  
 2. Pulse width limited by maximum junction temperature.



**Thermal Performance**

| Parameter                               | Symbol      | Limit | Unit |
|---|-------------|-------|------|
| Thermal Resistance, Junction-to-Ambient | $R_{th,ja}$ | 90    | °C/W |

Note : Surface mounted on 1 in<sup>2</sup> copper pad of FR-4 board, 270°C/W when mounted on minimum copper pad.

**Electrical Characteristics (T<sub>j</sub>=25°C, unless otherwise specified)**

| Symbol                       | Min. | Typ. | Max. | Unit | Test Conditions   |
|------------------------------|------|------|------|------|---|
| <b>Static</b>                |      |      |      |      |   |
| $BV_{DSS}$                   | -30  | -    | -    | V    | $V_{GS}=0, I_D=-250\mu A$   |
| $\Delta BV_{DSS}/\Delta T_j$ | -    | -0.1 | -    | V/°C | Reference to 25°C, $I_D=-1mA$                                       |
| $V_{GS(th)}$                 | -0.5 | -    | -1.2 | V    | $V_{DS}=V_{GS}, I_D=-250\mu A$                                      |
| $I_{GSS}$                    | -    | -    | ±100 | nA   | $V_{GS}=\pm 12V, V_{DS}=0$  |
| $I_{DSS}$                    | -    | -    | -1   | μA   | $V_{DS}=-30V, V_{GS}=0$   |
| $I_{DSS}$                    | -    | -    | -25  | μA   | $V_{DS}=-24V, V_{GS}=0, T_j=70^\circ C$                             |
| * $R_{DS(ON)}$               | -    | -    | 70   | mΩ   | $I_D=-2.6A, V_{GS}=-10V$  |
|                              | -    | -    | 85   |      | $I_D=-2.0A, V_{GS}=-4.5V$   |
|                              | -    | -    | 120  |      | $I_D=-1.0A, V_{GS}=-2.5V$   |
| * $G_{FS}$                   | -    | 9    | -    | S    | $V_{DS}=-5V, I_D=-3A$   |
| <b>Dynamic</b>               |      |      |      |      |   |
| $C_{iss}$                    | -    | 735  | 1325 | pF   | $V_{DS}=-25V, V_{GS}=0, f=1MHz$                                     |
| $C_{oss}$                    | -    | 100  | -    |      |   |
| $C_{rss}$                    | -    | 80   | -    |      |   |
| * $t_{d(ON)}$                | -    | 7    | -    | ns   | $V_{DS}=-15V, I_D=-3.2A, V_{GS}=-10V, R_D=4.6\Omega, R_G=3.3\Omega$ |
| * $t_r$                      | -    | 15   | -    |      |   |
| * $t_{d(OFF)}$               | -    | 21   | -    |      |   |
| * $t_f$                      | -    | 15   | -    |      |   |
| * $Q_g$                      | -    | 10   | 18   | nC   | $V_{DS}=-24V, I_D=-3.2A, V_{GS}=-4.5V,$                             |
| * $Q_{gs}$                   | -    | 1.8  | -    |      |   |
| * $Q_{gd}$                   | -    | 3.6  | -    |      |   |
| <b>Source-Drain Diode</b>    |      |      |      |      |   |
| * $V_{SD}$                   | -    | -    | -1.2 | V    | $V_{GS}=0V, I_{SD}=-1.2A$   |
| * $t_{rr}$                   | -    | 24   | -    | ns   | $I_S=-3.2A, V_{GS}=0V, dI/dt=100A/\mu s$                            |
| * $Q_{rr}$                   | -    | 19   | -    | nC   |   |

\*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

**Ordering Information**

| Device     | Package          | Shipping               | Marking |
|------------|------------------|------------------------|---------|
| MTP3403AN3 | SOT-23 (Pb-free) | 3000 pcs / Tape & Reel | 3403A   |

Characteristic Curves

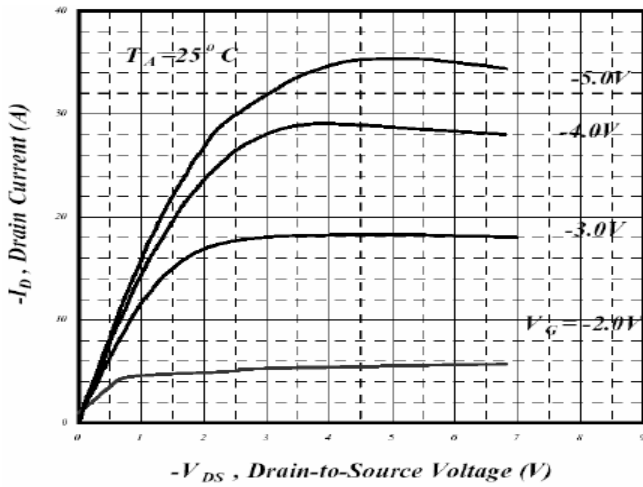


Fig 1. Typical Output Characteristics

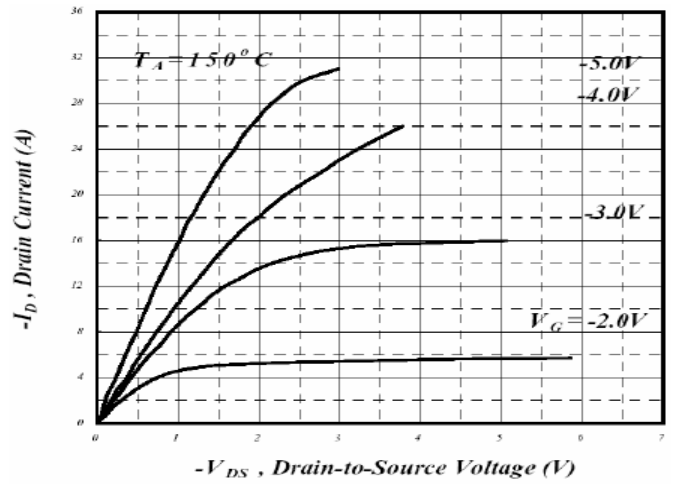


Fig 2. Typical Output Characteristics

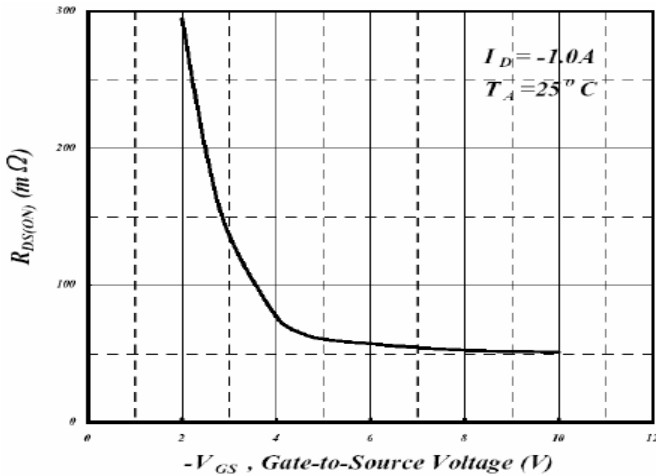


Fig 3. On-Resistance v.s. Gate Voltage

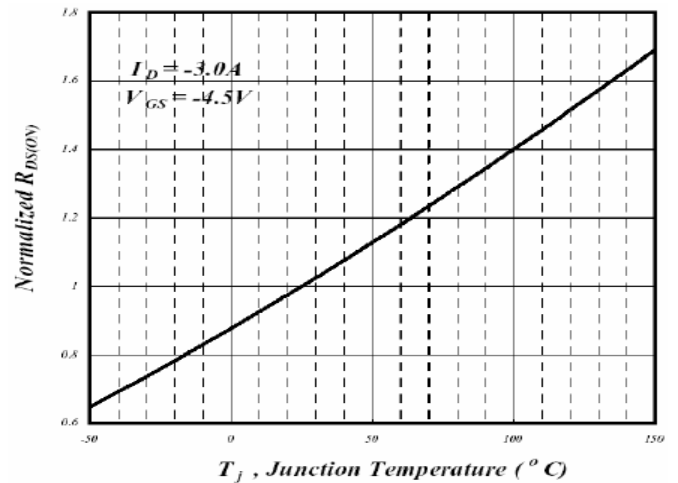


Fig 4. Normalized On-Resistance v.s. Junction Temperature

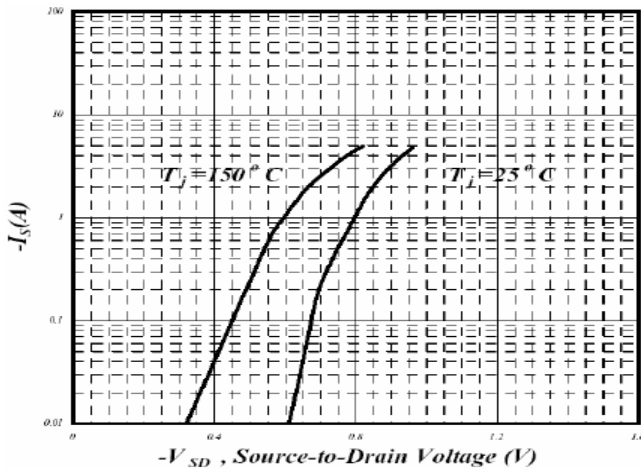


Fig 5. Forward Characteristics of Reverse Diode

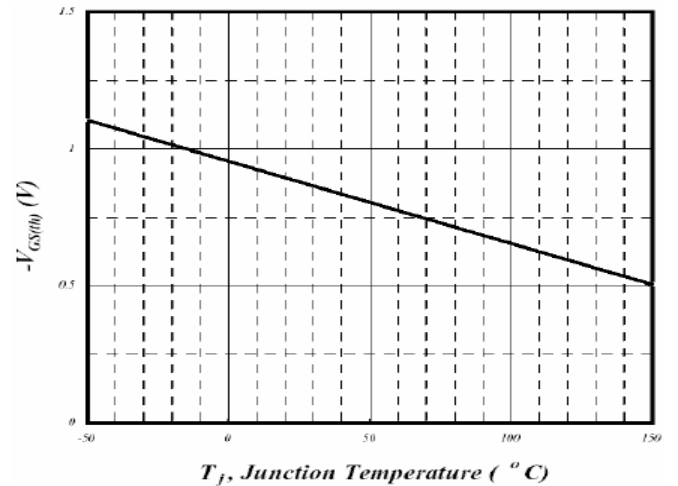
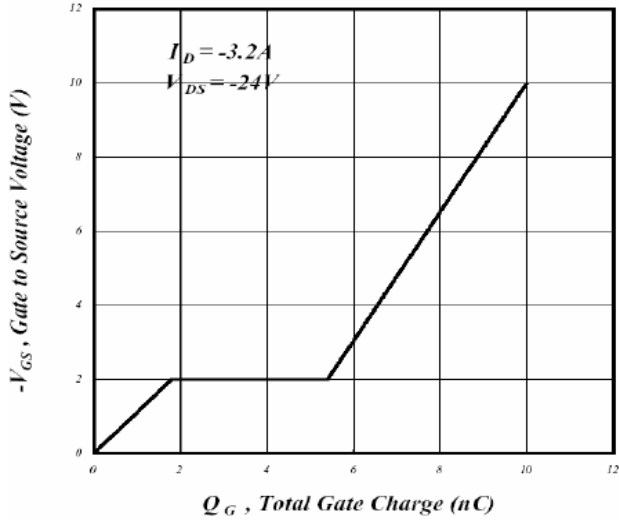
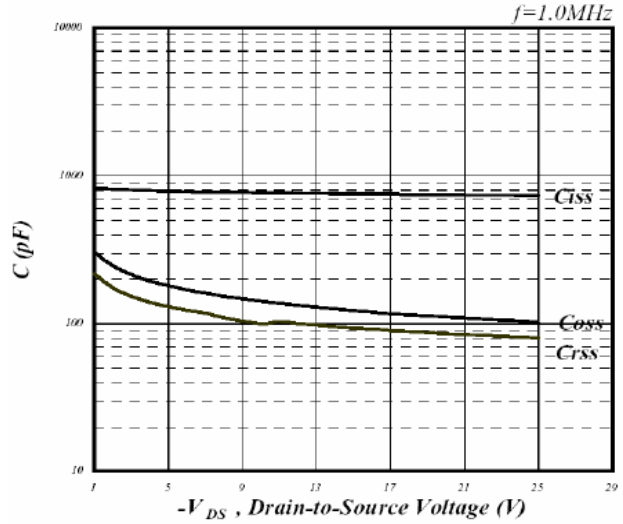


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

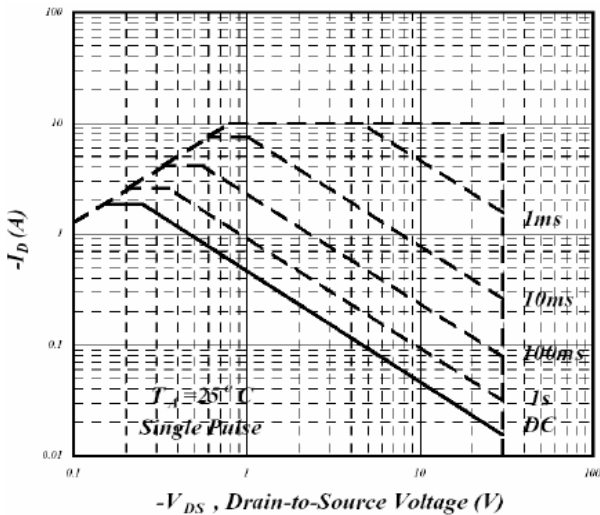
**Characteristic Curves(Cont.)**



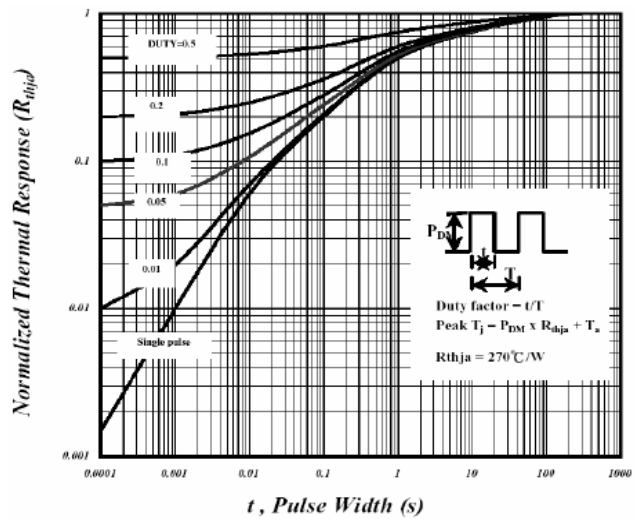
**Fig 7. Gate Charge Characteristics**



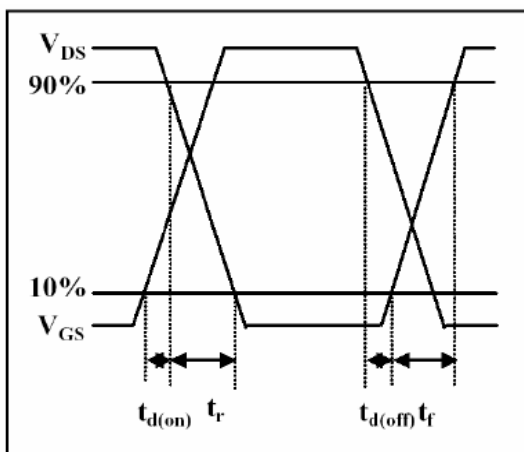
**Fig 8. Typical Capacitance Characteristics**



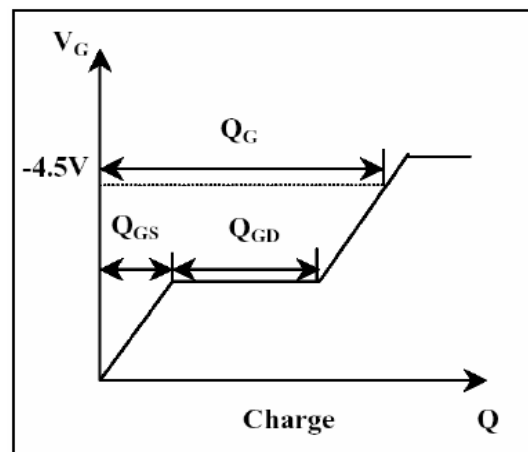
**Fig 9. Maximum Safe Operating Area**



**Fig 10. Effective Transient Thermal Impedance**

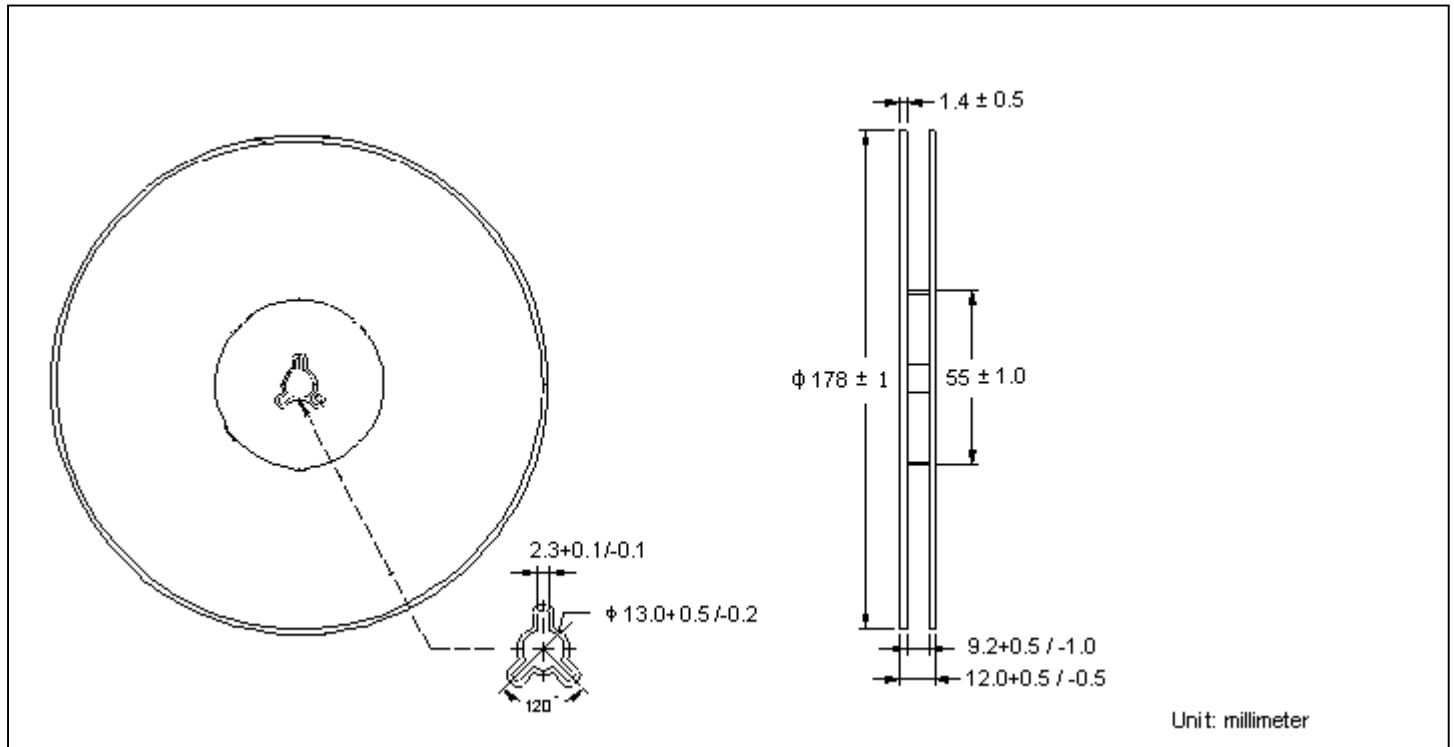


**Fig 11. Switching Time Waveform**

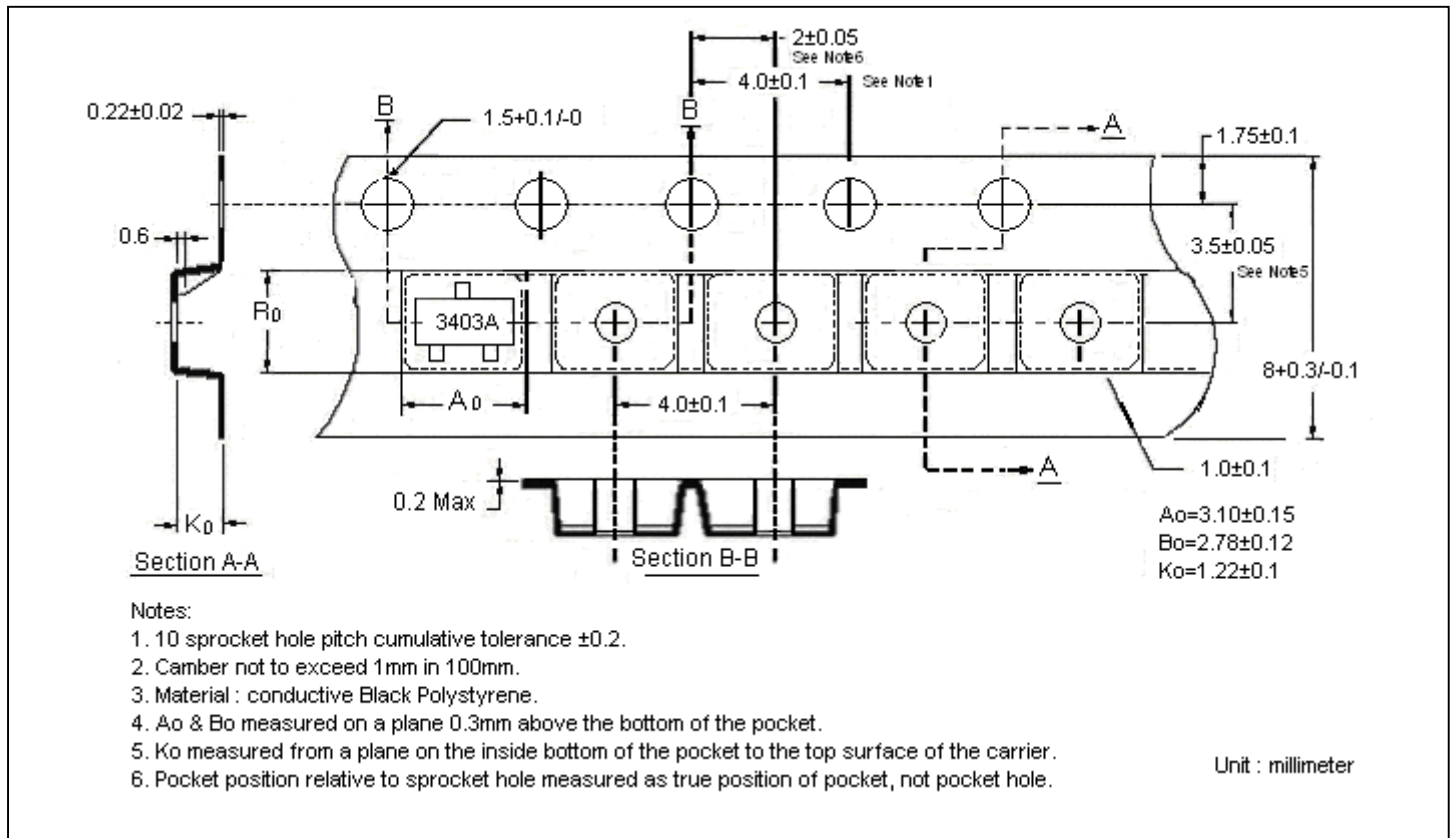


**Fig 12. Gate Charge Waveform**

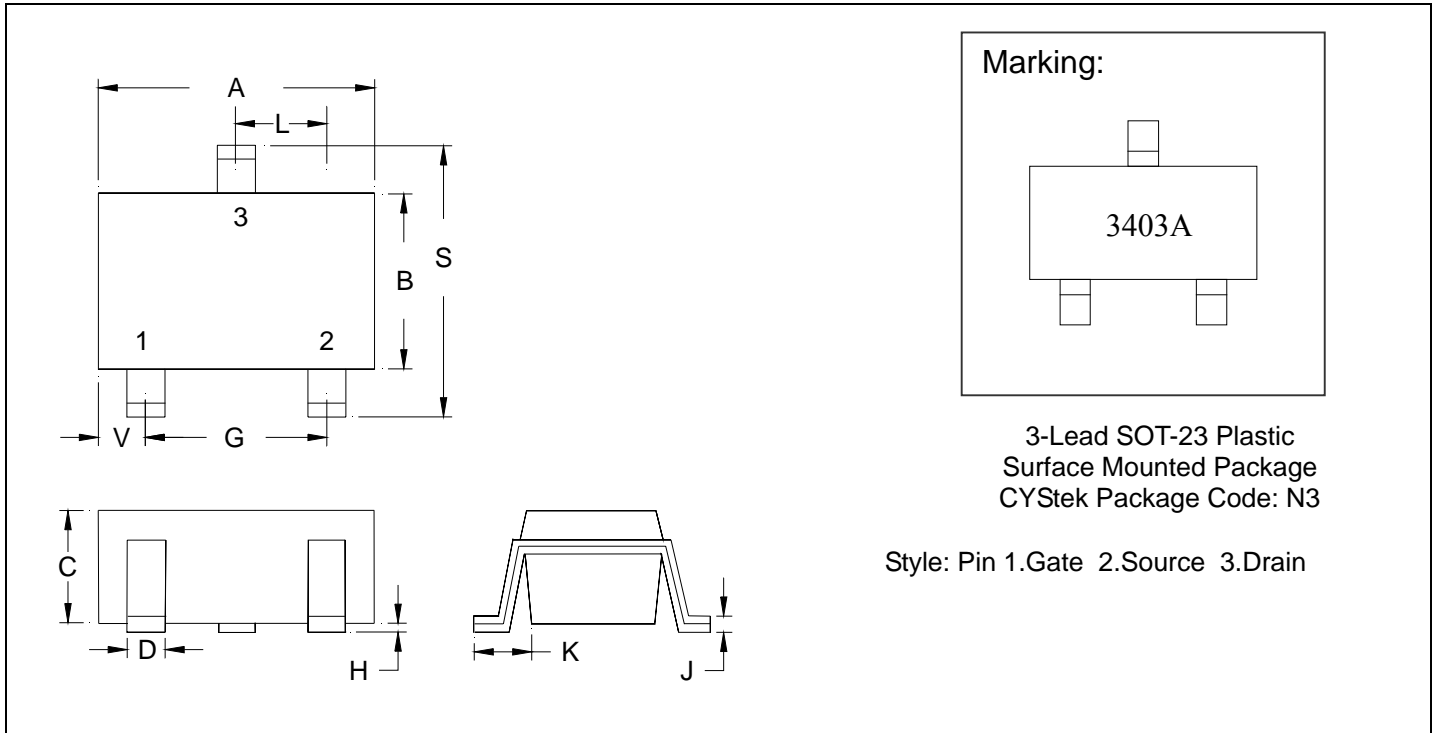
### Reel Dimension



### Carrier Tape Dimension



**SOT-23 Dimension**



\*: Typical

| DIM | Inches |        | Millimeters |      | DIM | Inches |        | Millimeters |       |
|-----|--------|--------|-------------|------|-----|--------|--------|-------------|-------|
|     | Min.   | Max.   | Min.        | Max. |     | Min.   | Max.   | Min.        | Max.  |
| A   | 0.1102 | 0.1204 | 2.80        | 3.04 | J   | 0.0034 | 0.0070 | 0.085       | 0.177 |
| B   | 0.0472 | 0.0630 | 1.20        | 1.60 | K   | 0.0128 | 0.0266 | 0.32        | 0.67  |
| C   | 0.0335 | 0.0512 | 0.89        | 1.30 | L   | 0.0335 | 0.0453 | 0.85        | 1.15  |
| D   | 0.0118 | 0.0197 | 0.30        | 0.50 | S   | 0.0830 | 0.1083 | 2.10        | 2.75  |
| G   | 0.0669 | 0.0910 | 1.70        | 2.30 | V   | 0.0098 | 0.0256 | 0.25        | 0.65  |
| H   | 0.0005 | 0.0040 | 0.013       | 0.10 |     |        |        |             |       |

Notes: 1.Controlling dimension: millimeters.

2.Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.

3.If there is any question with packing specification or packing method, please contact your local CYStek sales office.

**Material:**

- Lead: 42 Alloy ; solder plating
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0

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