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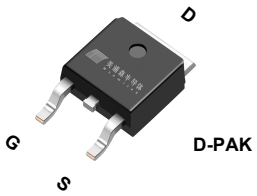
# SLD70P03T
## 30V P -Channel MOSFET

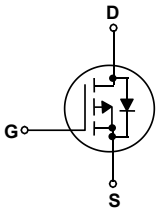
### General Description
This Power MOSFET is produced using Msemitek's advanced TRENCH technology.
This advanced technology has been especially tailored to minimize conduction loss, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode.

### Features
- P-Channel:-30V -70A
  $R_{DS(on)Typ}$= 5.7mΩ@VGS = -10 V
  $R_{DS(on)Typ}$= 8.0mΩ@VGS = -4.5 V
- Very Low On-resistance $R_{DS(ON)}$
- Low Crss
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability

### Application
☑ PWM Application
☑ Load Switch
☑ Power Management



D-PAK




## Absolute Maximum Ratings
$T_C$ = 25°C unless otherwise noted

| Symbol | Parameter | SLD70P03T | Units |
|---|---|---|---|
| $V_{DSS}$ | Drain-Source Voltage | -30 | V |
| $I_D$ | Drain Current - Continuous ($T_C$ = 25℃) | -70 | A |
| | Drain Current - Continuous ($T_C$ = 100℃) | -44 | A |
| $I_{DM}$ | Drain Current - Pulsed (Note 1) | -240 | A |
| $V_{GSS}$ | Gate-Source Voltage | ±20 | V |
| $E_{AS}$ | Single Pulsed Avalanche Energy | 230 | mJ |
| $P_D$ | Power Dissipation ($T_C$ = 25℃) | 110 | W |
| $R_{\theta JC}$ | Thermal Resistance, Junction to Case | 1.14 | ℃/W |
| $T_J$, $T_{STG}$ | Operating and Storage Temperature Range | -55 to +150 | ℃ |
| $T_L$ | Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds | 300 | ℃ |

* Drain current limited by maximum junction temperature.

## Package Marking

| Part Number | Top Marking | Package | Packing Method | MOQ | QTY |
|---|---|---|---|---|---|
| SLD70P03T | SLD70P03T | TO-252 | Tape & Reel | 2500 | 25000 |

## Electrical Characteristics

$T_C$ = 25°C unless otherwise noted

| Symbol | Parameter | Test Conditions | Min | Typ | Max | Units |
|---|---|---|---|---|---|---|
| **Off Characteristics** | | | | | | |
| $BV_{DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}$ = 0 V, $I_D$ = -250 uA | -30 | -- | -- | V |
| $I_{DSS}$ | Zero Gate Voltage Drain Current | $V_{DS}$ =-30 V, $V_{GS}$ = 0 V | -- | -- | -1 | uA |
| $I_{GSSF}$ | Gate-Body Leakage Current, Forward | $V_{GS}$ = 20V, $V_{DS}$ = 0 V | -- | -- | 100 | nA |
| $I_{GSSR}$ | Gate-Body Leakage Current, Reverse | $V_{GS}$ = -20 V, $V_{DS}$ = 0 V | -- | -- | -100 | nA |
| **On Characteristics** | | | | | | |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}$ = $V_{GS}$, $I_D$ = -250 uA | -1.0 | -1.5 | -2.0 | V |
| $R_{DS(on)}$ | Static Drain-Source On-Resistance | $V_{GS}$ =-10 V, $I_D$ = -20A | -- | 5.7 | 7.5 | mΩ |
| | | $V_{GS}$ =-4.5 V, $I_D$ = -20A | -- | 8.0 | 10.5 | |
| **Dynamic Characteristics** | | | | | | |
| $C_{iss}$ | Input Capacitance | $V_{DS}$ = -15 V, $V_{GS}$ = 0 V, f = 1.0 MHz | -- | 3151 | - | pF |
| $C_{oss}$ | Output Capacitance | | -- | 359 | - | pF |
| $C_{rss}$ | Reverse Transfer Capacitance | | -- | 343 | - | pF |
| **Switching Characteristics** | | | | | | |
| $t_{d(on)}$ | Turn-On Delay Time | $V_{GS}$= -10V, $V_{DS}$= -15V, $R_L$ = 3Ω ,$I_D$= -20A Tj=25℃ | -- | 11 | -- | ns |
| $t_r$ | Turn-On Rise Time | | -- | 48 | -- | ns |
| $t_{d(off)}$ | Turn-Off Delay Time | | -- | 76 | -- | ns |
| $t_f$ | Turn-Off Fall Time | | -- | 45 | -- | ns |
| $Q_g$ | Total Gate Charge | $V_{DS}$ =-15V, $I_D$ =-20A, $V_{GS}$ = -10V | -- | 85 | -- | nC |
| $Q_{gs}$ | Gate-Source Charge | | -- | 14 | -- | nC |
| $Q_{gd}$ | Gate-Drain Charge | | -- | 16 | -- | nC |
| $R_G$ | Gate Resistance | f = 1MHz | -- | 5.3 | -- | Ω |
| **Drain-Source Diode Characteristics and Maximum Ratings** | | | | | | |
| $I_S$ | Maximum Continuous Drain-Source Diode Forward Current | | -- | - | -70 | A |
| $I_{SM}$ | Maximum Pulsed Drain-Source Diode Forward Current | | -- | - | -210 | A |
| $V_{SD}$ | Drain to Source Diode Forward Voltage,$V_{GS}$ = 0V, $I_{SD}$ =-20A,$T_J$ = 25℃ | | -- | - | -1.2 | V |

**Notes:**
1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition: $T_J$ =25℃, $V_{DD}$ = -30V, $V_G$ = -10V, $R_G$ =25Ω, L=0.5mH.
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

## P- Channel Typical Characteristics

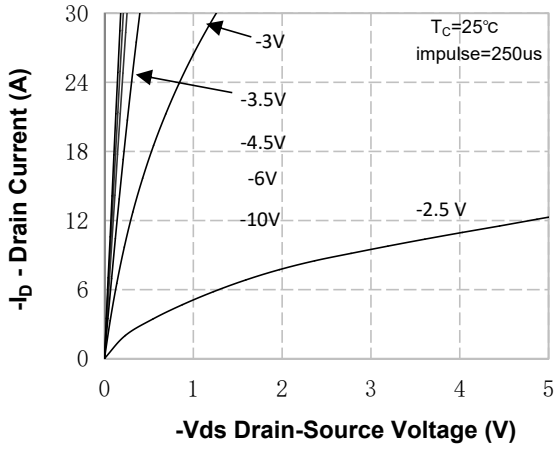



**Figure 1. On-Region Characteristics**

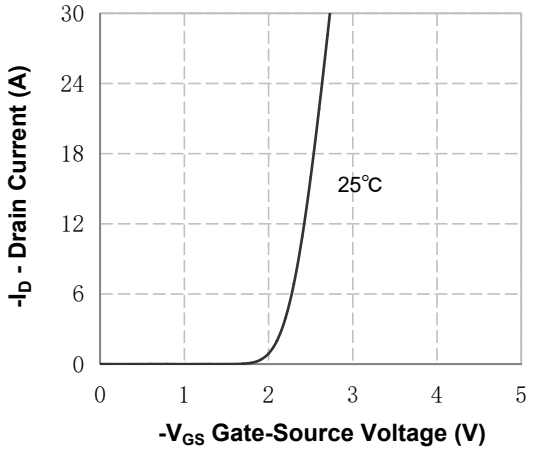



**Figure 2. Transfer Characteristics**

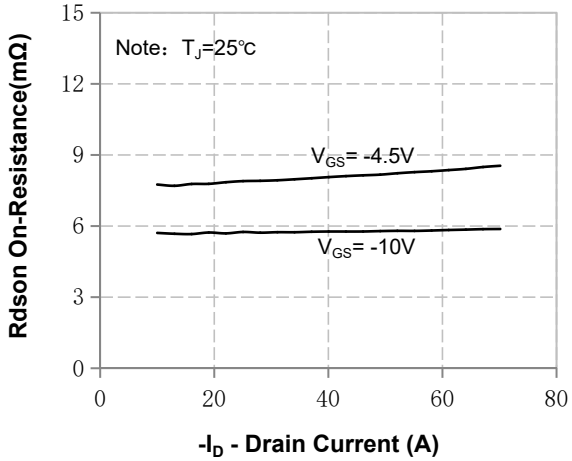



**Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage**

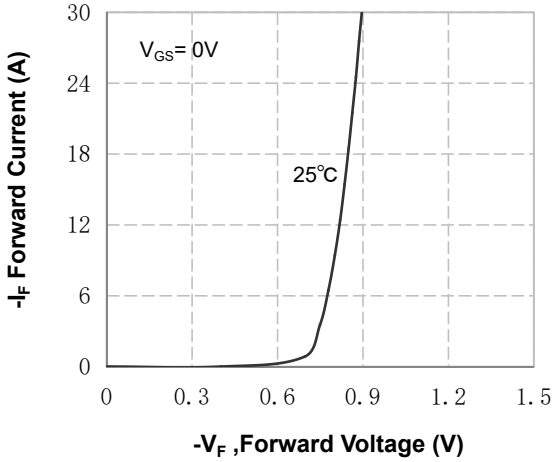



**Figure 4. Body Diode Forward Voltage Variation with Source Current**

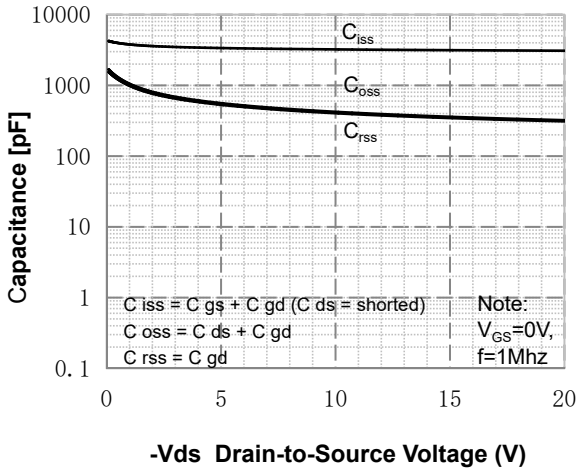



**Figure 5. Capacitance Characteristics**

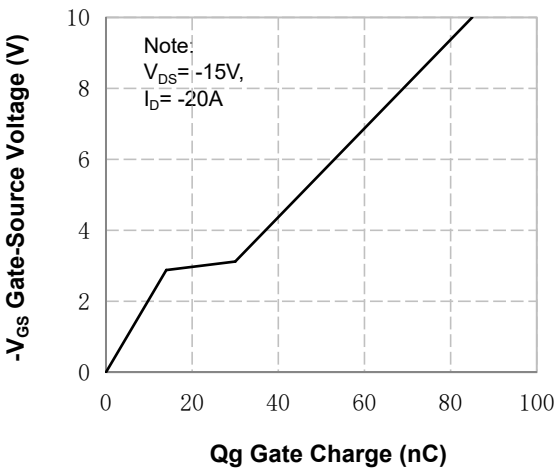



**Figure 6. Gate Charge Characteristics**

## P- Channel Typical Characteristics (Continued)

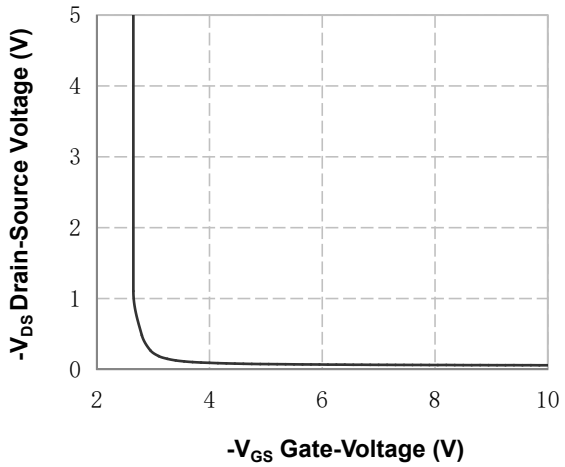



**Figure 7. Vds Drain-Source Voltage vs Gate Voltage**

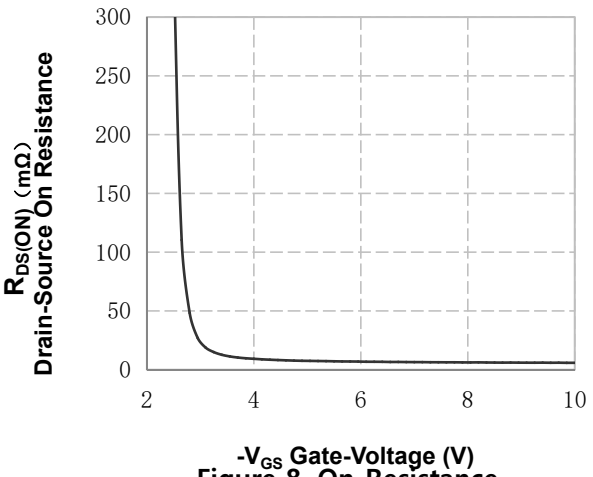



**Figure 8. On-Resistance vs Gate Voltage**

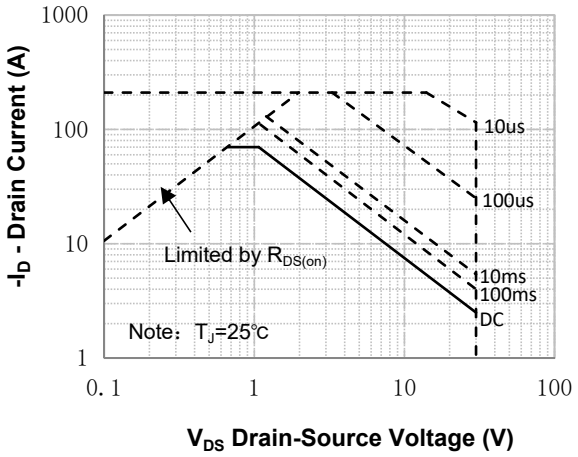



**Figure 9. Maximum Safe Operating Area**

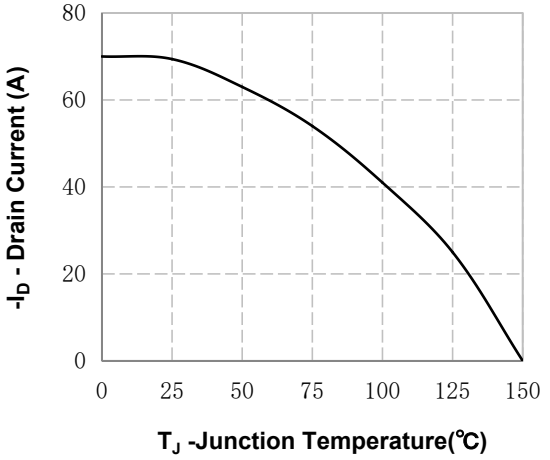



**Figure 10. Maximum Continuous Drain Current vs Temperature**

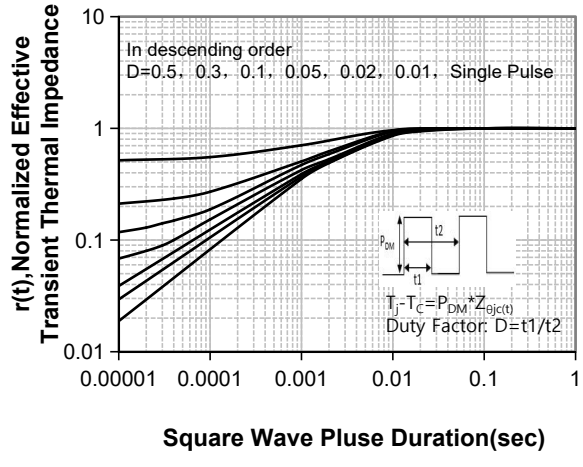
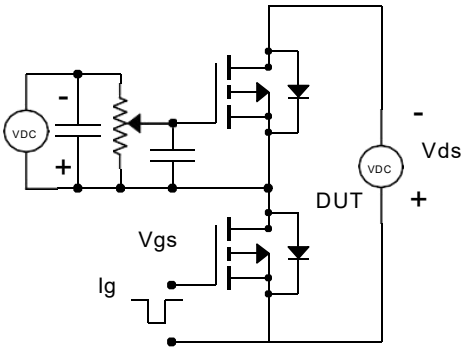
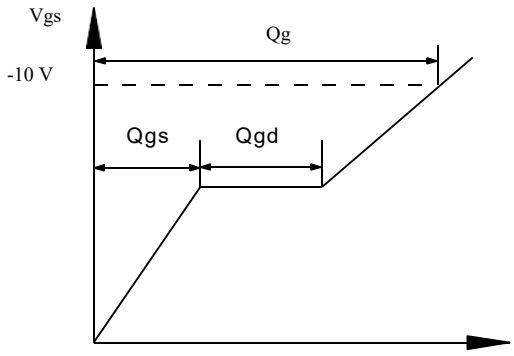


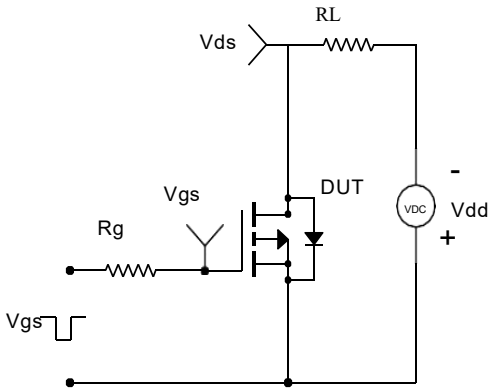

**Figure 11. Transient Thermal Response Curve**

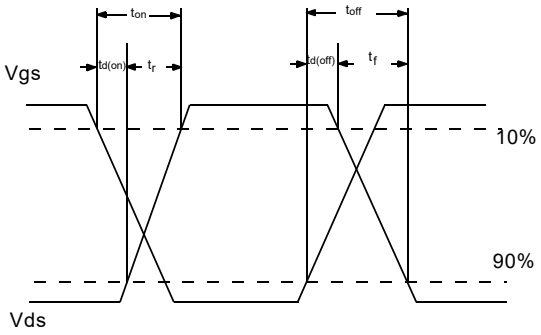
## Gate Charge Test Circuit & Waveform



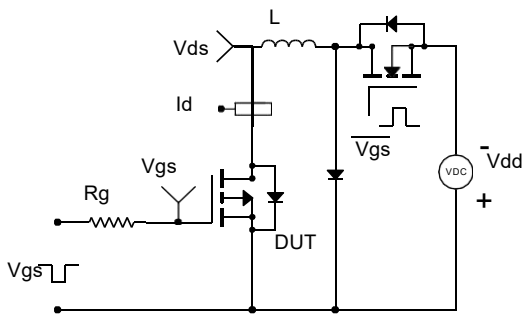



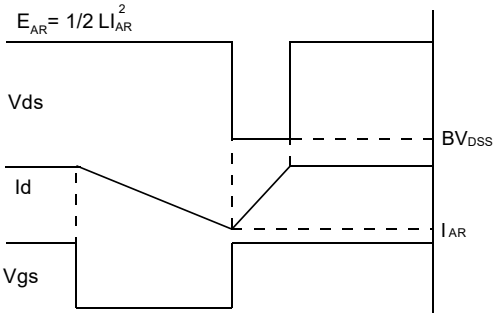

## Resistive Switching Test Circuit & Waveforms



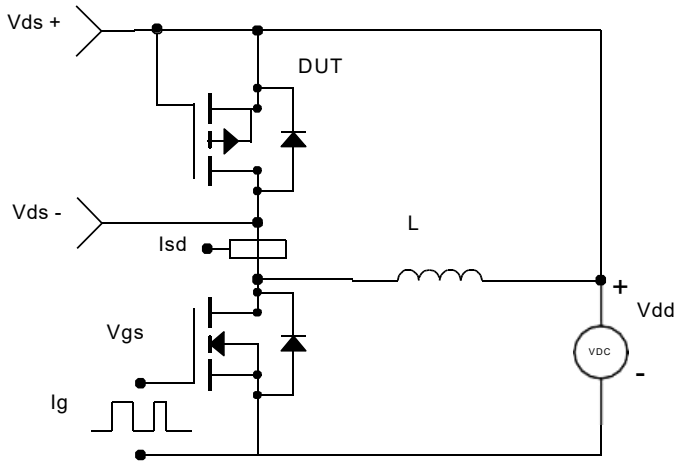




## Unclamped Inductive Switching Test Circuit & Waveforms

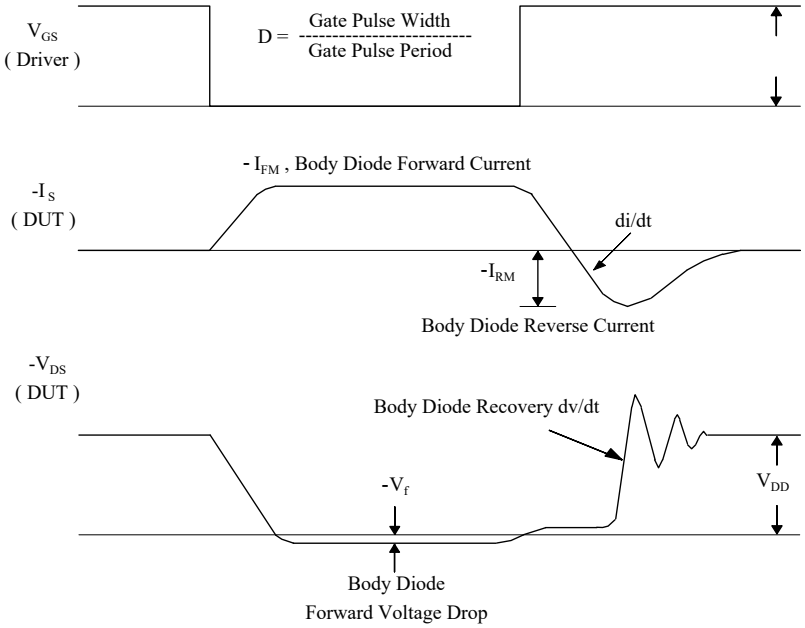


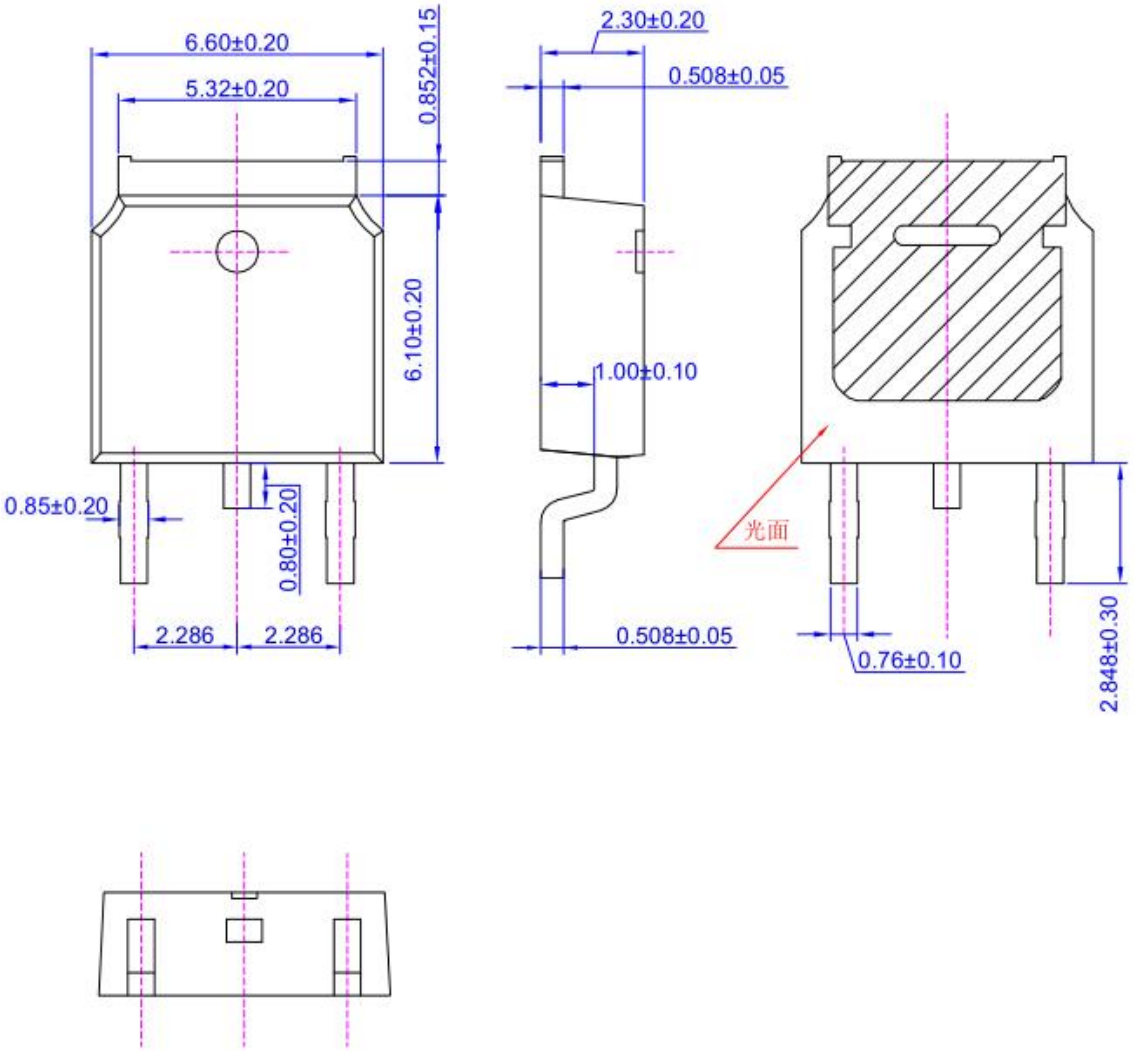
## Peak Diode Recovery dv/dt Test Circuit & Waveforms




• dv/dt controlled by $R_G$
• $I_{SD}$ controlled by pulse period



## TO-252 OUTLINE




NOTE：

1The plastic package is not marked as smooth surfaceRa=0.1;Subglossy surfaceRa=0.8

2.Undeclared tolerance±0.25,Unmarked filletRmax=0.25

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