

GTS6923

P-CHANNEL WITH SCHOTTKY DIODE POWER MOSFET

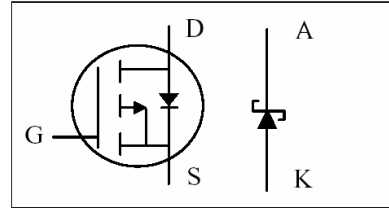
| | |
|--------------|--------------|
| V_{DS} | -20V |
| $R_{DS(ON)}$ | 50m Ω |
| I_D | -3.5A |

Description

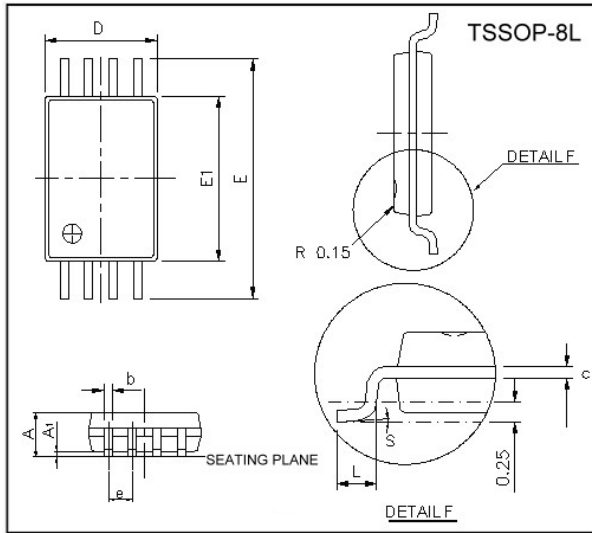
The GTS6923 provides the designer with the best combination of fast switching, ultra low on-resistance and cost-effectiveness.

Features

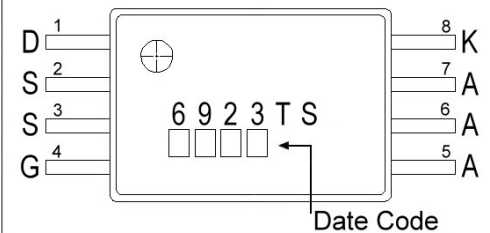
- *Low on-resistance
- *Fast Switch Characteristic
- *Included Schottky Diode



Package Dimensions



Marking :



| REF. | Millimeter | | REF. | Millimeter | |
|------|------------|------|------|------------|------|
| | Min. | Max. | | Min. | Max. |
| A | - | 1.20 | E | 6.20 | 6.60 |
| A1 | 0.05 | 0.15 | E1 | 4.30 | 4.50 |
| b | 0.19 | 0.30 | e | 0.65 BSC | |
| c | 0.09 | 0.20 | L | 0.45 | 0.75 |
| D | 2.90 | 3.10 | S | 0° | 8° |

Absolute Maximum Ratings

| Parameter | Symbol | Ratings | Unit |
|--|-----------------------|------------|------------|
| Drain-Source Voltage (MOSFET and Schottky) | V_{DS} | -20 | V |
| Reverse Voltage (Schottky) | V_{KA} | 20 | V |
| Gate-Source Voltage (MOSFET) | V_{GS} | ± 12 | V |
| Continuous Drain Current ³ (MOSFET) | $I_D @ Ta=25^\circ C$ | -3.5 | A |
| Continuous Drain Current ³ (MOSFET) | $I_D @ Ta=70^\circ C$ | -2.8 | A |
| Pulsed Drain Current ¹ (MOSFET) | I_{DM} | -30 | A |
| Average Forward Current (Schottky) | I_F | 1 | A |
| Pulsed Forward Current ¹ (Schottky) | I_{FM} | 25 | A |
| Total Power Dissipation (MOSFET) | $P_D @ Ta=25^\circ C$ | 1 | W |
| Total Power Dissipation (Schottky) | | 1 | W |
| Storage Temperature Range | T_{stg} | -55 ~ +150 | $^\circ C$ |
| Operating Junction Temperature Range | T_j | -55 ~ +125 | $^\circ C$ |

Thermal Data

| Parameter | Symbol | Value | Unit |
|--|--------|-------|--------------|
| Thermal Resistance Junction-ambient ² (MOSFET) Max. | Rthj-a | 125 | $^\circ C/W$ |
| Thermal Resistance Junction-ambient ³ (Schottky) Max. | | | |

Electrical Characteristics (Tj = 25°C unless otherwise specified)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test Conditions |
|--|-------------------------------------|------|-------|------|------|---|
| Drain-Source Breakdown Voltage | BV _{DSS} | -20 | - | - | V | V _{GS} =0, I _D =-250uA |
| Breakdown Voltage Temperature Coefficient | ΔBV _{DSS} /ΔT _J | - | -0.03 | - | V/°C | Reference to 25°C, I _D =-1mA |
| Gate Threshold Voltage | V _{GS(th)} | -0.5 | - | - | V | V _{DS} =V _{GS} , I _D =-250uA |
| Forward Transconductance | g _{fs} | - | 10 | - | S | V _{DS} =-10V, I _D =-3.5A |
| Gate-Source Leakage Current | I _{GSS} | - | - | ±100 | nA | V _{GS} = ±12V |
| Drain-Source Leakage Current(Tj=25°C) | I _{DSS} | - | - | -1 | uA | V _{DS} =-20V, V _{GS} =0 |
| Drain-Source Leakage Current(Tj=70°C) | | - | - | -25 | uA | V _{DS} =-16V, V _{GS} =0 |
| Static Drain-Source On-Resistance ² | R _{DS(ON)} | - | - | 50 | mΩ | V _{GS} =-4.5V, I _D =-3.5A |
| | | - | - | 85 | | V _{GS} =-2.5V, I _D =-2.7A |
| Total Gate Charge ² | Q _g | - | 15.6 | - | nC | I _D =-3.5A V _{DS} =-10V V _{GS} =-4.5V |
| Gate-Source Charge | Q _{gs} | - | 2.1 | - | | |
| Gate-Drain ("Miller") Charge | Q _{gd} | - | 5.2 | - | | |
| Turn-on Delay Time ² | T _{d(on)} | - | 8.2 | - | ns | V _{DS} =-10V I _D =-1A V _{GS} =-4.5V R _G =3.3Ω R _D =10Ω |
| Rise Time | T _r | - | 9.4 | - | | |
| Turn-off Delay Time | T _{d(off)} | - | 66.4 | - | | |
| Fall Time | T _f | - | 48 | - | | |
| Input Capacitance | C _{iss} | - | 660 | - | pF | V _{GS} =0V V _{DS} =-20V f=1.0MHz |
| Output Capacitance | C _{oss} | - | 285 | - | | |
| Reverse Transfer Capacitance | C _{rss} | - | 130 | - | | |

Source-Drain Diode

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test Conditions |
|---------------------------------------|-----------------|------|------|-------|------|--|
| Forward On Voltage ² | V _{SD} | - | - | -1.2 | V | I _S =-0.83A, V _{GS} =0V |
| Continuous Source Current(Body Diode) | I _S | - | - | -0.83 | A | V _D = V _G =0V, V _S =-1.2V |

Schottky Characteristics @ Tj=25°C

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test Conditions |
|------------------------------|-----------------|------|------|------|------|---------------------|
| Forward Voltage Drop | V _F | - | - | 0.5 | V | I _F =1A |
| Max. Reverse Leakage Current | I _{RM} | - | - | 100 | uA | V _R =20V |

Notes: 1. Pulse width limited by Max. junction temperature.

2. Pulse width ≤ 300us, duty cycle ≤ 2%.

3. Surface mounted on 1 in² copper pad of FR4 board; 208°C/W when mounted on Min. copper pad.

MOSFET Characteristics Curve

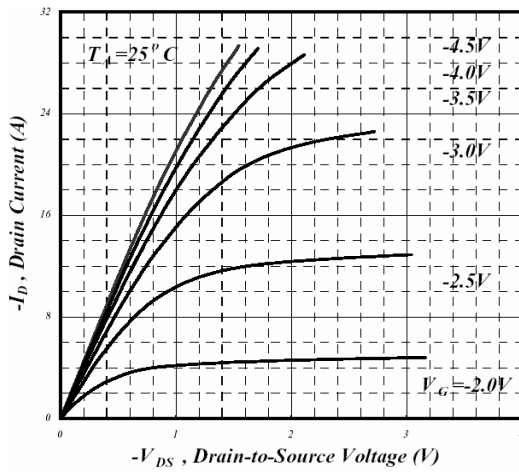


Fig 1. Typical Output Characteristics

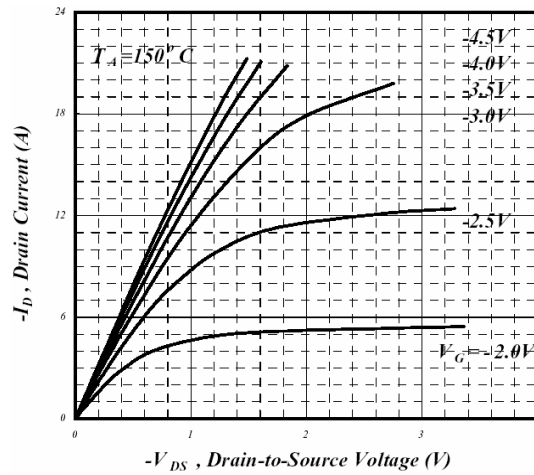


Fig 2. Typical Output Characteristics

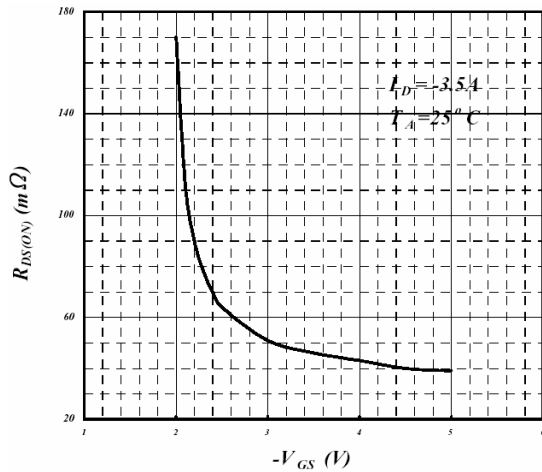


Fig 3. On-Resistance v.s. Gate Voltage

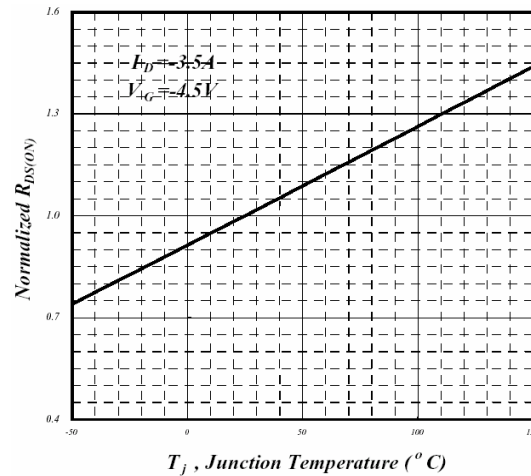


Fig 4. Normalized On-Resistance v.s. Junction Temperature

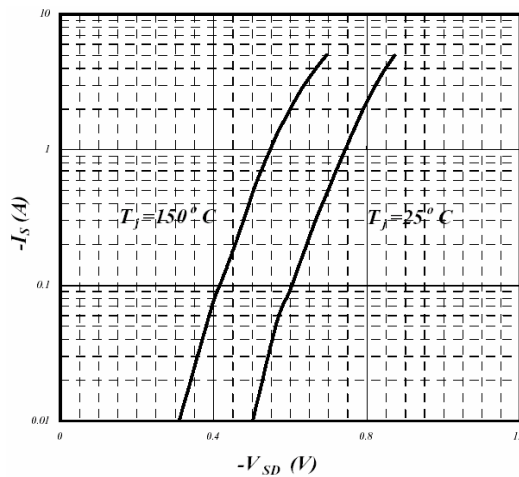


Fig 5. Forward Characteristics of Reverse Diode

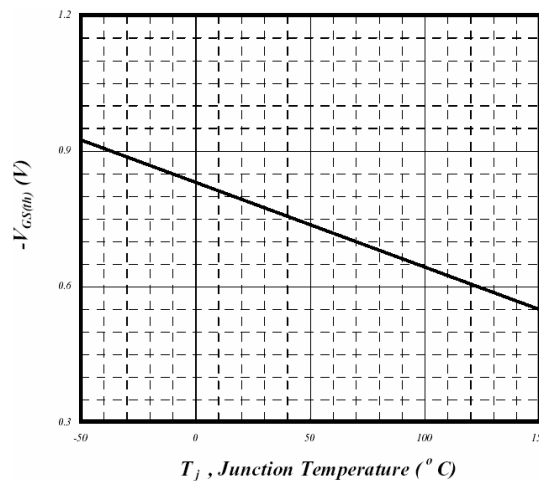


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

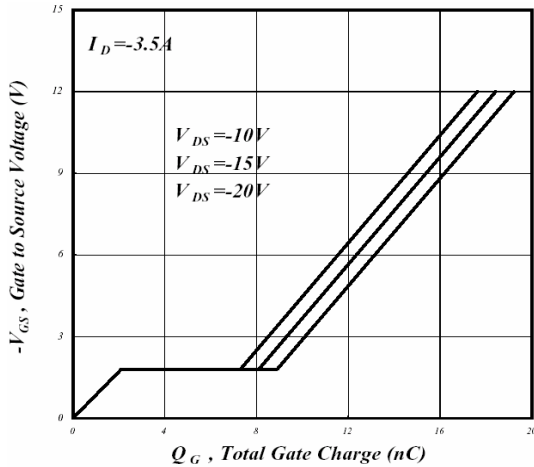


Fig 7. Gate Charge Characteristics

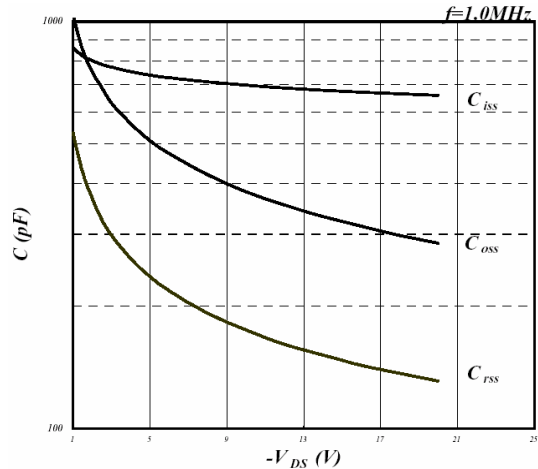


Fig 8. Typical Capacitance Characteristics

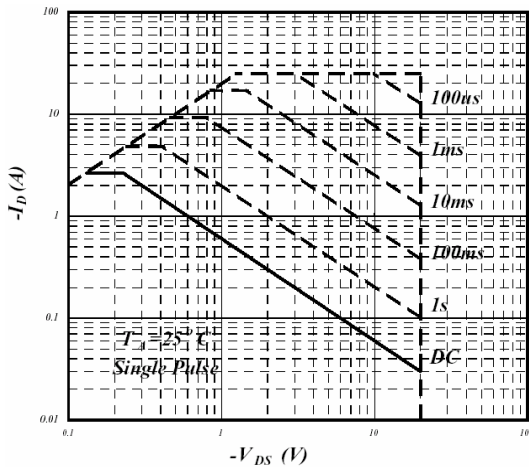


Fig 9. Maximum Safe Operating Area

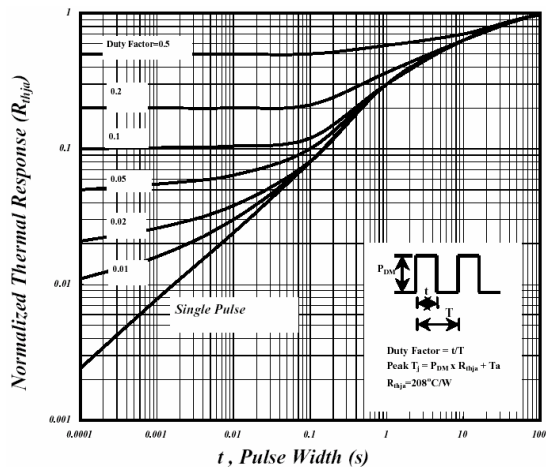


Fig 10. Effective Transient Thermal Impedance

SCHOTTKY DIODE

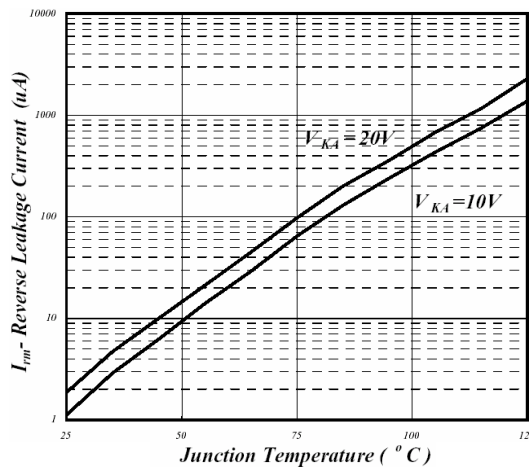


Fig 1. Reverse Leakage Current v.s. Junction Temperature

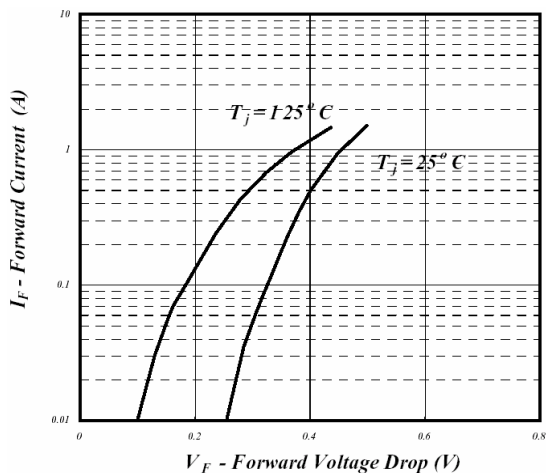


Fig 2. Forward Voltage Drop

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