# GSM1073TX6F

## 20V P-Channel Enhancement Mode MOSFET

### Product Description

GSM1073TX6F, P-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent $R_{DS(ON)}$, low gate charge.

These devices are particularly suited for low voltage power management, such as smart phone and notebook computer, and low in-line power loss are needed in commercial industrial surface mount applications.

### Features

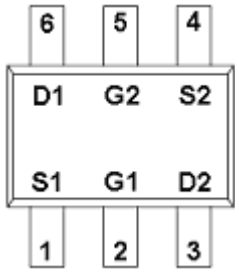
- -20V/-0.5A, $R_{DS(ON)}$=900mΩ@$V_{GS}$=-4.5V
- -20V/-0.2A, $R_{DS(ON)}$=1450mΩ@$V_{GS}$=-2.5V
- -20V/-0.1A, $R_{DS(ON)}$=2400mΩ@$V_{GS}$=-1.8V
- Low-Voltage Operation
- High-Speed Circuits
- ESD Protection
- SOT-363 package design

### Applications

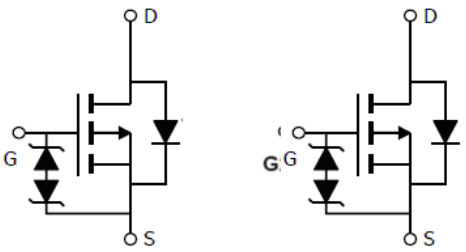
- Drivers : Relays, Solenoids, Lamps, Hammers
- Battery Operated Systems
- Power Supply Converter Circuits
- Load/Power Switching Smart Phones, Pagers

### Packages & Pin Assignments

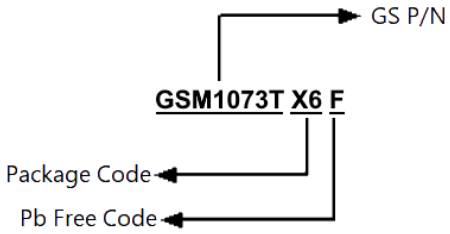
**GSM1073TX6F (SOT-363)**



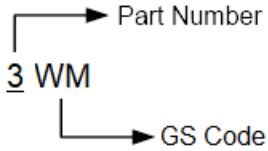

| Pin | Description |
|---|---|
| 1 | Source1 |
| 2 | Gate1 |
| 3 | Drain2 |
| 4 | Source2 |
| 5 | Gate2 |
| 6 | Drain1 |



## Ordering Information




## Marking Information




| Part Number | Package | Part Marking |
|---|---|---|
| GSM1073TX6F | SOT-363 | 3WM |

## Absolute Maximum Ratings

($T_A$=25ºC unless otherwise noted)

| Symbol | Parameter | | Typical | Unit |
|---|---|---|---|---|
| $V_{DSS}$ | Drain-Source Voltage | | -20 | V |
| $V_{GSS}$ | Gate-Source Voltage | | ±8 | V |
| $I_D$ | Continuous Drain Current($T_J$=150℃) | $T_A$=25℃ | -0.5 | A |
| | | $T_A$=70℃ | -0.4 | |
| $I_{DM}$ | Pulsed Drain Current | | -2 | A |
| $P_D$ | Power Dissipation | $T_A$=25℃ | 0.42 | W |
| | | $T_A$=70℃ | 0.3 | |
| $R_{\theta JA}$ | Thermal Resistance Junction to ambient | | 300 | ºC/W |
| $T_J$ | Operating Junction Temperature Range | | -55 to +150 | ºC |
| $T_{STG}$ | Storage Temperature Range | | -55 to +150 | ºC |

## Electrical Characteristics

($T_A$=25ºC unless otherwise noted)

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **Static** | | | | | | |
| $V_{(BR)DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}$=0V, $I_D$=-250uA | -20 | | | V |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}$=$V_{GS}$, $I_D$=-250uA | -0.3 | | -1.0 | |
| $I_{GSS}$ | Gate Leakage Current | $V_{DS}$=0V, $V_{GS}$=±8V | | | ±10 | uA |
| $I_{DSS}$ | Zero Gate Voltage Drain Current | $V_{DS}$=-20V, $V_{GS}$=0V | | | -1 | uA |
| | | $V_{DS}$=-16V, $V_{GS}$=0V $T_J$=85ºC | | | -30 | |
| $R_{DS(on)}$ | Drain-Source On-Resistance | $V_{GS}$=-4.5V, $I_D$=-0.5A | | 565 | 900 | mΩ |
| | | $V_{GS}$=-2.5V, $I_D$=-0.2A | | 760 | 1450 | |
| | | $V_{GS}$=-1.8V, $I_D$=-0.1A | | 990 | 2400 | |
| | | $V_{GS}$=-1.5V, $I_D$=-0.1A | | 1225 | | |
| $g_{FS}$ | Forward Transconductance | $V_{DS}$=-10V, $I_D$=-0.3A | | 1.2 | | S |
| $V_{SD}$ | Diode Forward Voltage | $I_S$=-0.5A, $V_{GS}$=0V | | | -1.3 | V |
| **Dynamic** | | | | | | |
| $Q_g$ | Total Gate Charge | $V_{DS}$=-10V, $V_{GS}$=-4.5V, $I_D$=-0.25A | | 0.62 | | nC |
| $Q_{gs}$ | Gate-Source Charge | | | 0.1 | | |
| $Q_{gd}$ | Gate-Drain Charge | | | 0.13 | | |
| $C_{iss}$ | Input Capacitance | $V_{DS}$=-16V, $V_{GS}$=0V f=1MHz | | 59.8 | | pF |
| $C_{oss}$ | Output Capacitance | | | 12.1 | | |
| $C_{rss}$ | Reverse Transfer Capacitance | | | 6.4 | | |
| $t_{d(on)}$ | Turn-On Time | $V_{DD}$=-10V, $R_L$=47Ω, $I_D$≡-0.2A $V_{GEN}$=-4.5V, $R_G$=10Ω | | 5.1 | | ns |
| $t_r$ | | | | 8.1 | | |
| $t_{d(off)}$ | Turn-Off Time | | | 28.4 | | |
| $t_f$ | | | | 20.7 | | |

## Typical Performance Characteristics

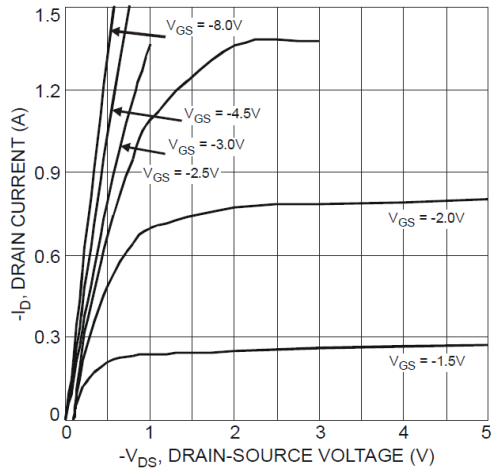



Fig. 1 Typical Output Characteristics

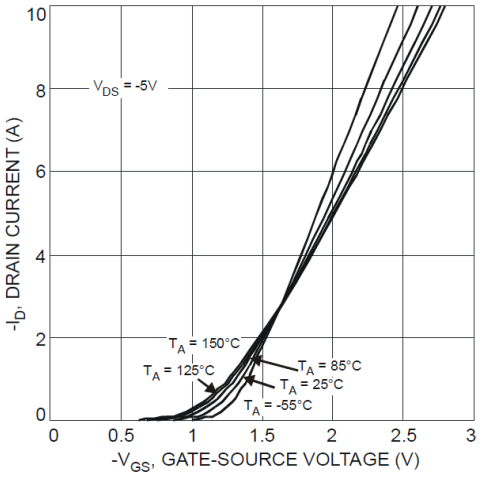



Fig. 2 Typical Transfer Characteristics

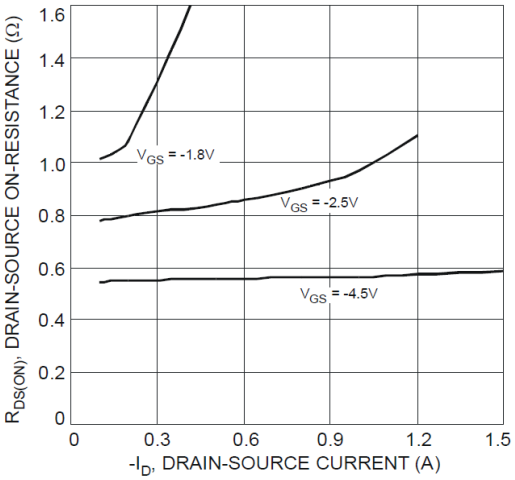



Fig. 3 Typical On-Resistance vs. $I_D$ and $V_{GS}$

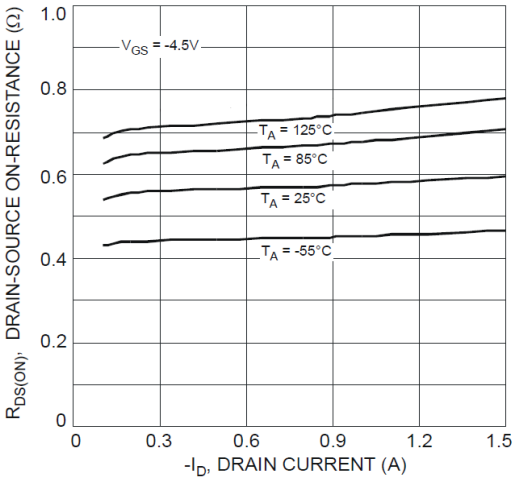



Fig. 4 Typical Drain-Source On-Resistance vs. $I_D$ and $T_J$

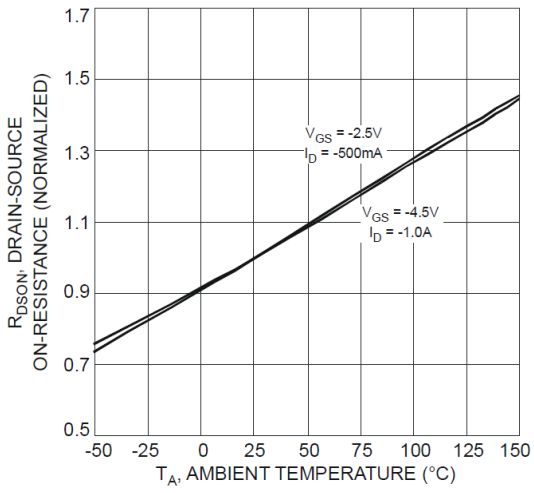



Fig. 5 On-Resistance Variation with $T_J$

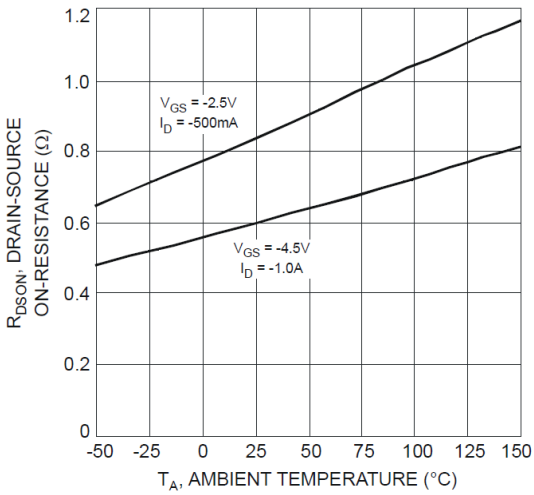



Fig. 6 On-Resistance Variation with $T_J$

## Typical Performance Characteristics **(continue)**

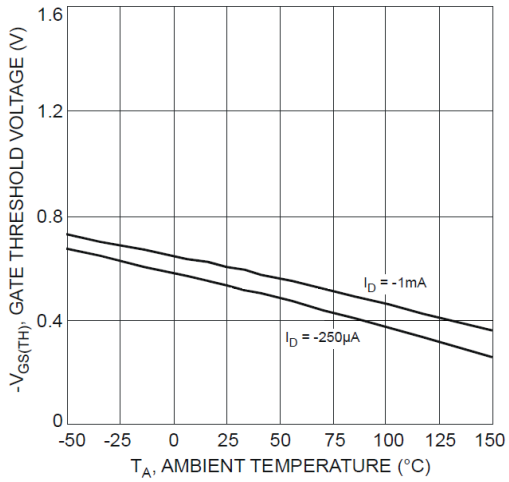



Fig. 7 Gate Threshold Variation vs. $T_A$

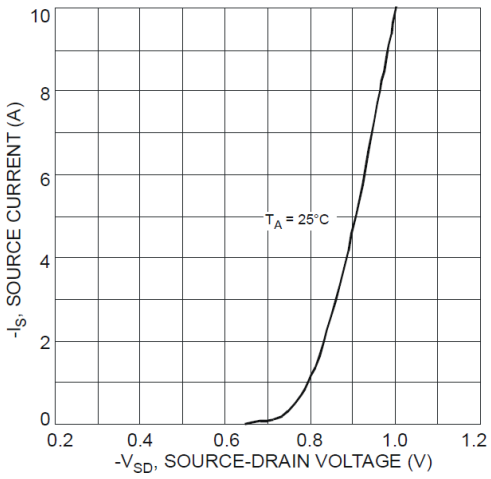



Fig. 8 Diode Forward Voltage vs. Current

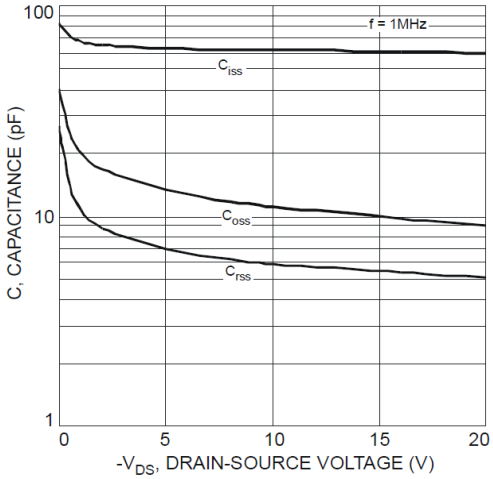



Fig. 9 Typical Capacitance

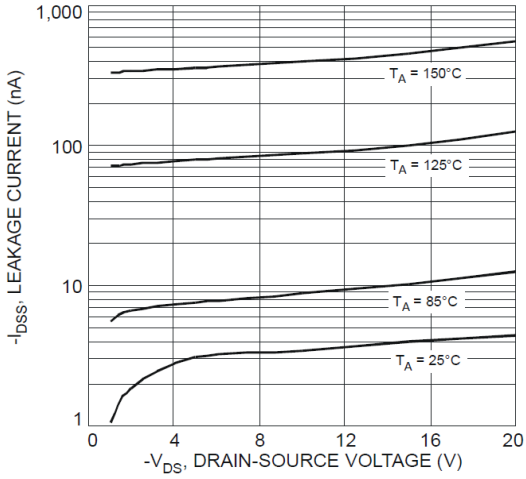



Fig. 10 Typical Drain-Source Leakage Current vs. Drain-Source Voltage

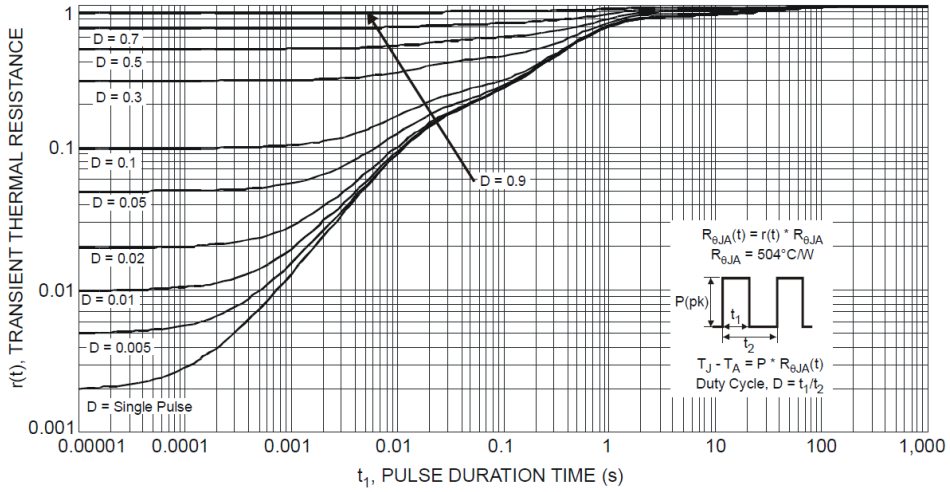
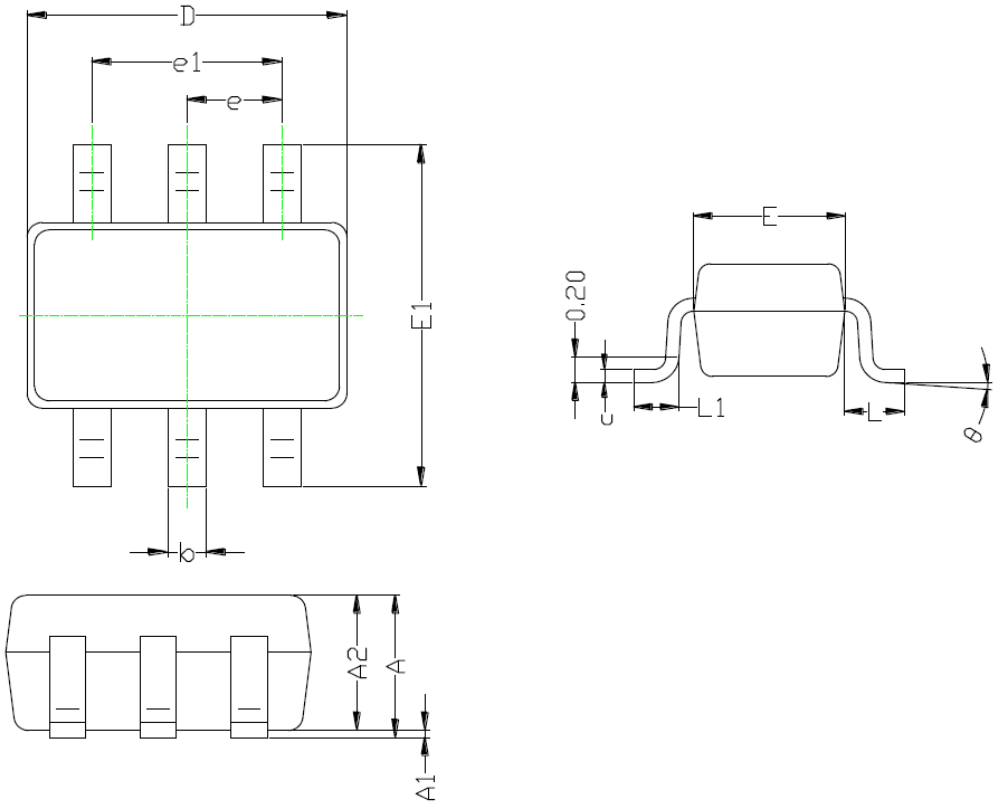



Fig. 11 Transient Thermal Response

## Package Dimension

### SOT-363




| Dimensions | | | | |
|---|---|---|---|---|
| SYMBOL | Millimeters | | Inches | |
| | MIN | MAX | MIN | MAX |
| A | 0.90 | 1.00 | 0.035 | 0.039 |
| A1 | 0.00 | 0.10 | 0.000 | 0.004 |
| A2 | 0.90 | 1.00 | 0.035 | 0.039 |
| b | 0.15 | 0.30 | 0.006 | 0.012 |
| c | 0.10 | 0.15 | 0.004 | 0.006 |
| D | 2.00 | 2.20 | 0.079 | 0.087 |
| E | 1.15 | 1.35 | 0.045 | 0.053 |
| E1 | 2.15 | 2.40 | 0.085 | 0.094 |
| e | 0.650 BSC | | 0.026 BSC | |
| e1 | 1.20 | 1.40 | 0.047 | 0.055 |
| L | 0.525 BSC | | 0.021 BSC | |
| L1 | 0.26 | 0.45 | 0.010 | 0.018 |
| $\theta$ | 0° | 8° | 0° | 8° |

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