

Surface Mount P-Channel Enhancement Mode MOSFET

(Pb) Lead(Pb)-Free

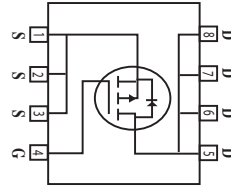
Features:

- * Super high dense
- * Cell design for low $R_{DS(ON)}$
- * $R_{DS(ON)} < 10\text{m}\Omega @ V_{GS} = -10\text{V}$
- * $R_{DS(ON)} < 13\text{m}\Omega @ V_{GS} = -4.5\text{V}$
- * Simple Drive Requirement
- * Lower On-resistance
- * Fast Switching

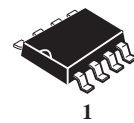
Description:

The WTK6679 provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness.

The SOP-8 package is universally preferred for all commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters.



DRAIN CURRENT
-14 AMPERES
DRAIN SOURCE VOLTAGE
-30 VOLTAGE



SOP-8

Maximum Ratings ($T_A = 25^\circ\text{C}$ Unless Otherwise Specified)

| Rating | Symbol | Value | Unit |
|------------------------------------------------------------------------------------------|-----------------|-------------|---------------------------|
| Drain-Source Voltage | V_{DS} | -30 | V |
| Gate-Source Voltage | V_{GS} | ± 25 | V |
| Continuous Drain Current ($T_A = 25^\circ\text{C}$) ($T_A = 70^\circ\text{C}$) | I_D | -14 -8.9 | A |
| Pulsed Drain Current ⁽¹⁾ | I_{DM} | -50 | A |
| Power Dissipation ($T_A = 25^\circ\text{C}$) | P_D | 2.5 | W |
| Maximax Junction-to-Ambient | $R_{\theta JA}$ | 50 | $^\circ\text{C}/\text{W}$ |
| Operating Junction Temperature Range | T_J | +150 | $^\circ\text{C}$ |
| Storage Temperature Range | T_{stg} | -55 to +150 | $^\circ\text{C}$ |

Device Marking

WTK6679=6679SC

Electrical Characteristics (T_A=25°C Unless otherwise noted)

| Characteristic | Symbol | Min | Typ | Max | Unit |
|-----------------------------------------------------------------------------------------------------------------------------|----------------------|--------|--------|-----------|------|
| Drain-Source Breakdown Voltage V _{GS} =0V, I _D =-250 μA | V _{(BR)DSS} | -30 | - | - | V |
| Gate-Source Threshold Voltage V _{DS} =V _{GS} , I _D =-250 μA | V _{GS(th)} | -1.0 | - | -3.0 | V |
| Gate-Source Leakage Current V _{DS} =0V, V _{GS} =±25V | I _{GSS} | - | - | ±100 | nA |
| Zero Gate Voltage Drain Current V _{DS} =-30V, V _{GS} =0V V _{DS} =-24V, V _{GS} =0V | I _{DSS} | - | - | -1 -25 | μA |
| Drain-Source On-Resistance V _{GS} =-10V, I _D =-14A V _{GS} =-4.5V, I _D =-11A | R _{DS(on)} | - - | - - | 10 13 | mΩ |
| Forward Transconductance V _{DS} =-10V, I _D =-14A | g _{fs} | - | 26 | - | S |

Dynamic

| | | | | | |
|------------------------------------------------------------------------------------|------------------|---|------|------|----|
| Input Capacitance V _{DS} =-25V, V _{GS} =0V, f=1MHZ | C _{iss} | - | 2860 | 4580 | pF |
| Output Capacitance V _{DS} =-25V, V _{GS} =0V, f=1MHZ | C _{oss} | - | 950 | - | |
| Reverse Transfer Capacitance V _{DS} =-25V, V _{GS} =0V, f=1MHZ | C _{rss} | - | 640 | - | |

Switching

| | | | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|---|----|------|----|
| Turn-On Delay Time ⁽²⁾ V _{DS} = -15V, I _D = -1A, V _{GS} = -10V, R _G = 3.3Ω, R _D = 15Ω | t _{d(on)} | - | 13 | - | nS |
| Rise Time V _{DS} = -15V, I _D = -1A, V _{GS} = -10V, R _G = 3.3Ω, R _D = 15Ω | t _r | - | 11 | - | nS |
| Turn-Off Time V _{DS} = -15V, I _D = -1A, V _{GS} = -10V, R _G = 3.3Ω, R _D = 15Ω | t _{d(off)} | - | 58 | - | nS |
| Fall Time V _{DS} = -15V, I _D = -1A, V _{GS} = -10V, R _G = 3.3Ω, R _D = 15Ω | t _f | - | 43 | - | nS |
| Total Gate Charge ⁽²⁾ V _{DS} =-24V, I _D =-14A, V _{GS} =-4.5V | Q _g | - | 37 | 60 | nC |
| Gate-Source Charge V _{DS} =-24V, I _D =-14A, V _{GS} =-4.5V | Q _{gs} | - | 3 | - | nC |
| Gate-Drain Charge V _{DS} =-24V, I _D =-14A, V _{GS} =-4.5V | Q _{gd} | - | 25 | - | nC |
| Forward On Voltage ⁽²⁾ V _{GS} =0V, I _S =-2A | V _{SD} | - | - | -1.2 | V |
| Reverse Recovery Time ⁽²⁾ V _{GS} =0V, I _S =-14A, dl/dt=100A/μs | T _{rr} | - | 48 | - | nS |
| Reverse Recovery Charge V _{GS} =0V, I _S =-14A, dl/dt=100A/μs | Q _{rr} | - | 46 | - | nC |

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; 125°C/W when mounted on Min. copper pad.

Characteristics Curve

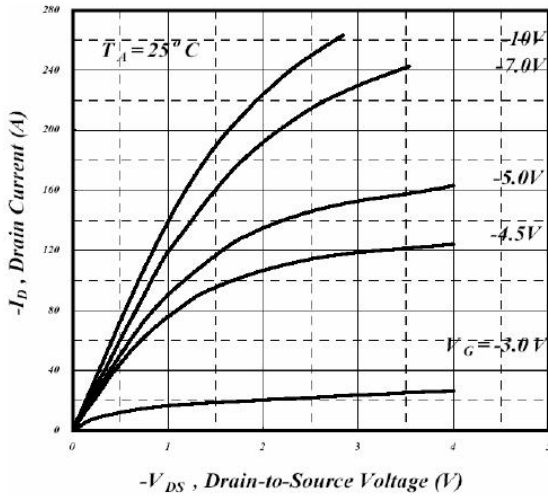


Fig 1. Typical Output Characteristics

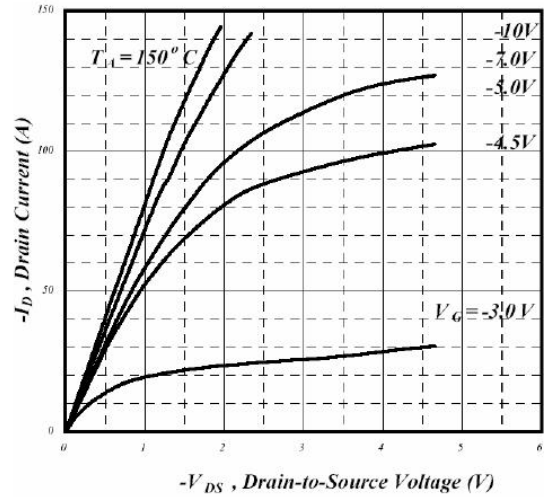


Fig 2. Typical Output Characteristics

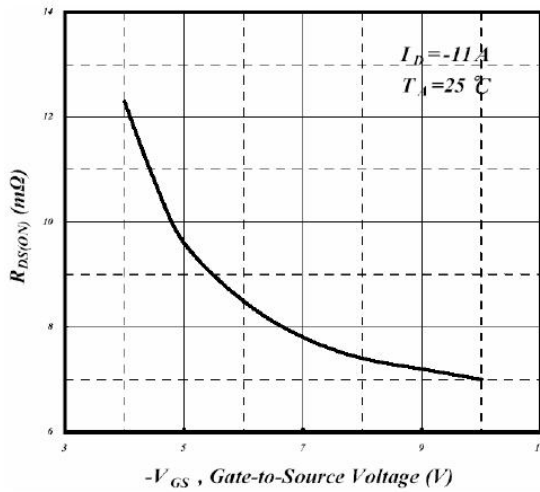


Fig 3. On-Resistance v.s. Gate Voltage

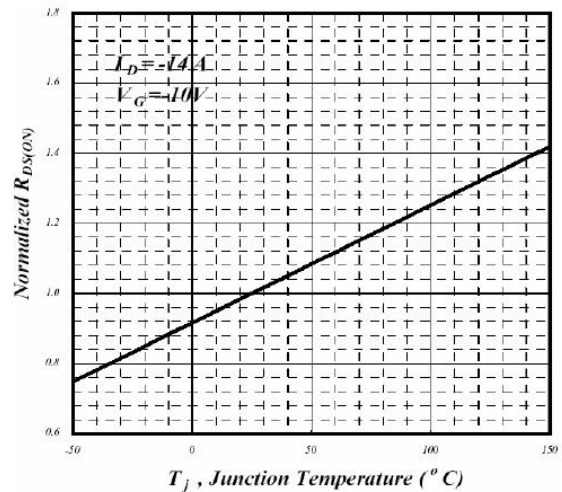


Fig 4. Normalized On-Resistance v.s. Junction Temperature

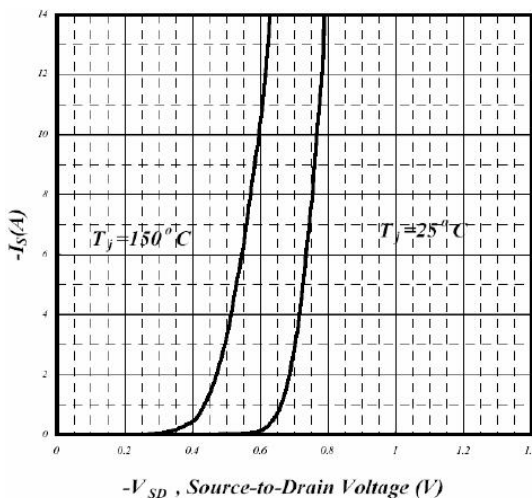


Fig 5. Forward Characteristics of Reverse Diode

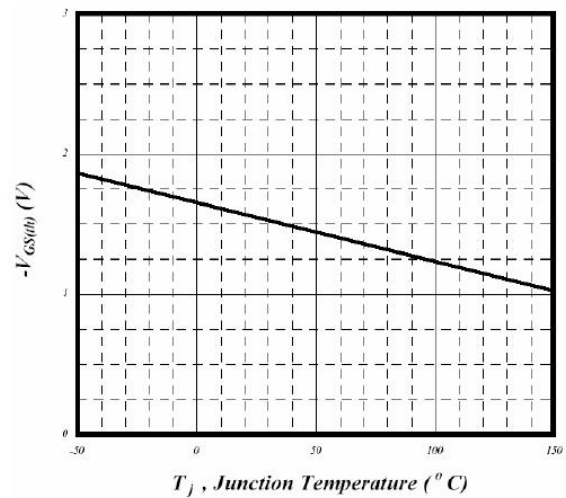


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

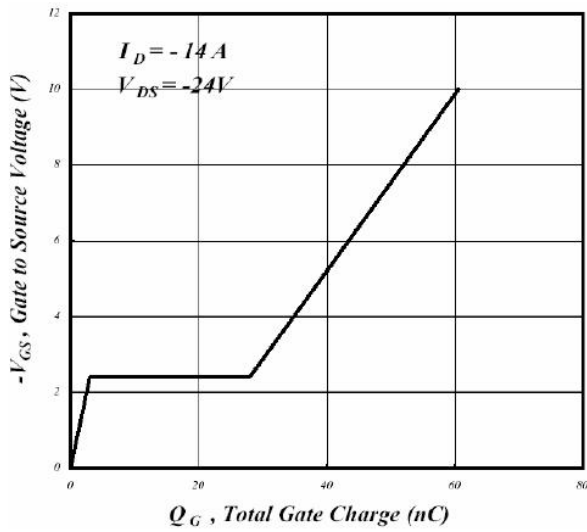


Fig 7. Gate Charge Characteristics

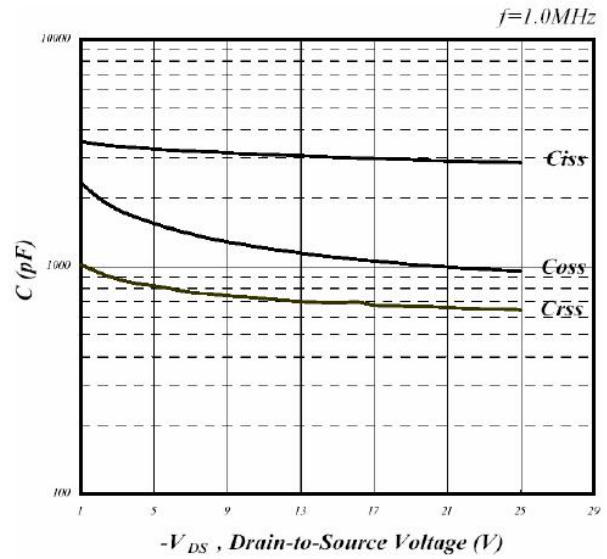


Fig 8. Typical Capacitance Characteristics

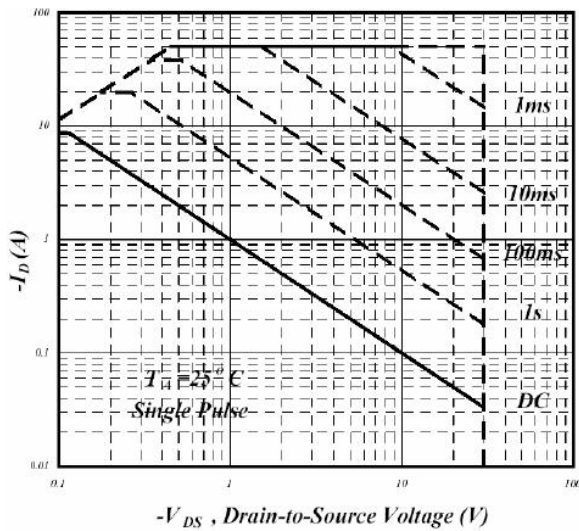


Fig 9. Maximum Safe Operating Area

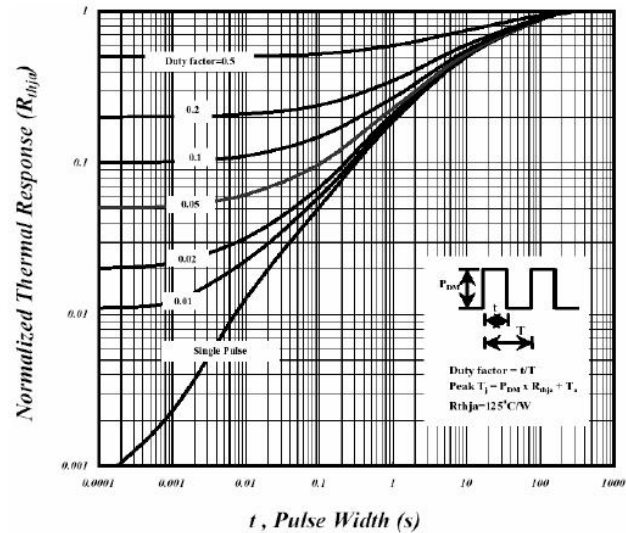


Fig 10. Effective Transient Thermal Impedance

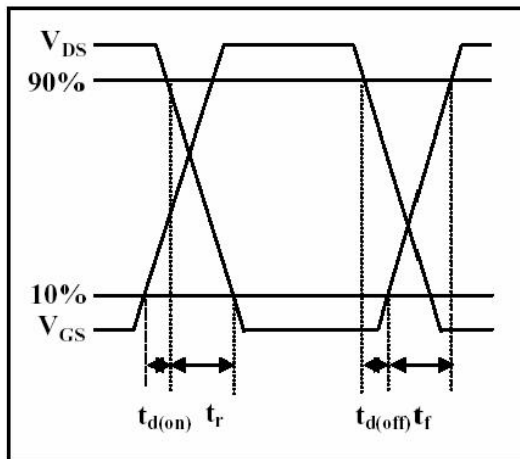


Fig 11. Switching Time Waveform

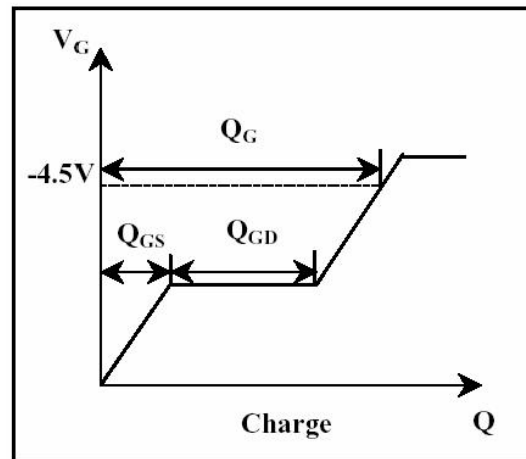
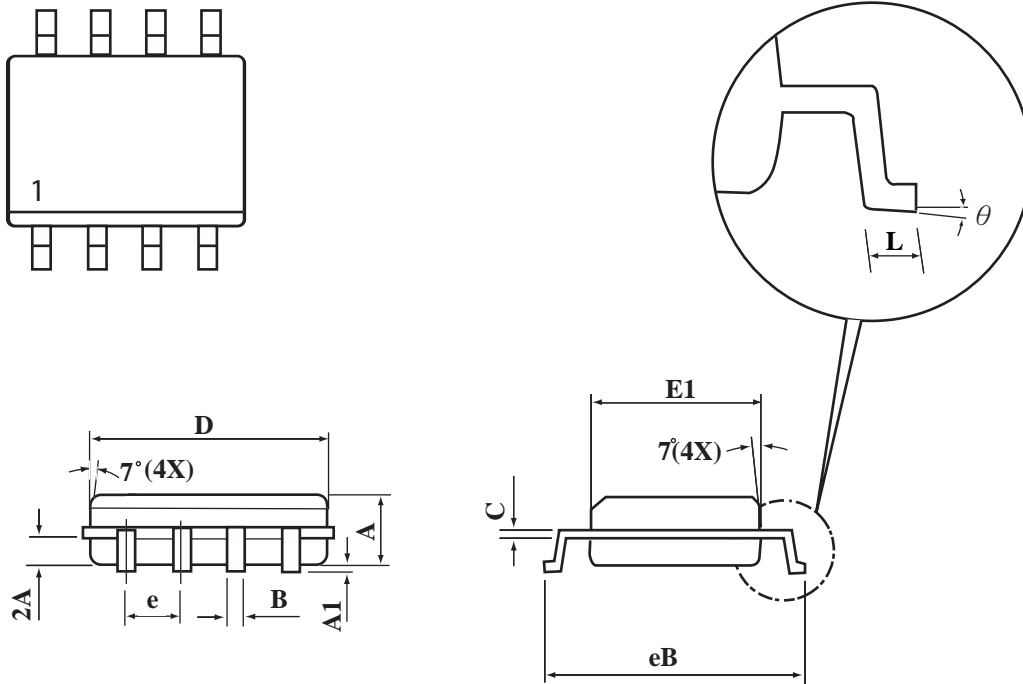


Fig 12. Gate Charge Waveform

SOP-8 Package Outline Dimensions

Unit:mm



| SYMBOLS | MILLIMETERS | |
|---------|-------------|------|
| | MIN | MAX |
| A | 1.35 | 1.75 |
| A1 | 0.10 | 0.20 |
| B | 0.35 | 0.45 |
| C | 0.18 | 0.23 |
| D | 4.69 | 4.98 |
| E1 | 3.56 | 4.06 |
| eB | 5.70 | 6.30 |
| e | 1.27 BSC | |
| L | 0.60 | 0.80 |
| θ | 0° | 8° |