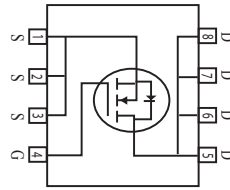


Surface Mount N-Channel Enhancement Mode MOSFET

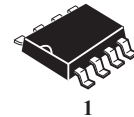
(Pb) Lead(Pb)-Free



DRAIN CURRENT
18 AMPERES
DRAIN SOURCE VOLTAGE
30 VOLTAGE

Features:

- * Simple Drive Requirement.
- * Low On-Resistance.
- * Fast Switching.
- * Super high dense cell design for low $R_{DS(ON)}$
 $R_{DS(ON)} < 5.5m\Omega @ V_{GS} = 10V$
 $R_{DS(ON)} < 6.2m\Omega @ V_{GS} = 4.5V$
 $R_{DS(ON)} < 8.0m\Omega @ V_{GS} = 2.5V$
- * Rugged and Reliable.
- * SOP-8 Package.



SOP-8

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

| Rating | Symbol | Value | Unite |
|--|-----------------|-------------|--------------|
| Drain-Source Voltage | V_{DS} | 30 | V |
| Gate-Source Voltage | V_{GS} | ± 12 | V |
| Continuous Drain Current ⁽¹⁾ ($T_A = 25^\circ C$) ($T_A = 70^\circ C$) | I_D | 18 15 | A |
| Pulsed Drain Current ⁽²⁾ | I_{DM} | 80 | A |
| Power Dissipation($T_A = 25^\circ C$) | PD | 2.5 | W |
| Maximax Junction-to-Ambient ⁽¹⁾ | $R_{\theta JA}$ | 50 | $^\circ C/W$ |
| Junction Temperature Range | T_J | +150 | $^\circ C$ |
| Storage Temperature Range | T_{stg} | -55 to +150 | $^\circ C$ |

Device Marking

WTK9410 = 9410SC

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

| Characteristic | Symbol | Min | Typ | Max | Unit |
|---|----------------------|-----|-----|-------------------|------|
| Static (2) | | | | | |
| Drain-Source Breakdown Voltage V _{GS} =0V, I _D =250μA | V _{(BR)DSS} | 30 | - | - | V |
| Gate-Source Threshold Voltage V _{DS} =V _{GS} , I _D =250μA | V _{GS(th)} | - | - | 1.2 | V |
| Gate-Source Leakage Current V _{DS} =0V, V _{GS} =±12V | I _{GSS} | - | - | ±100 | nA |
| Drain-Source Leakage Current @T _j =25C, V _{DS} =30V, V _{GS} =0V @T _j =70C, V _{DS} =24V, V _{GS} =0V | I _{DSS} | - | - | 1 25 | μA |
| Drain-Source On-Resistance ³ V _{GS} =10V, I _D =18A V _{GS} =4.5V, I _D =12A V _{GS} =2.5V, I _D =6A | r _{DS(on)} | - | - | 5.5 6.2 8.0 | mΩ |
| Forward Transconductance V _{DS} =10V, I _D =12A | g _{fs} | - | 47 | - | S |

Dynamic

 (3)

| | | | | | |
|---|------------------|---|------|------|----|
| Input Capacitance V _{DS} =25V, V _{GS} =0V, f=1.0MHZ | C _{iSS} | - | 5080 | 8100 | pF |
| Output Capacitance V _{DS} =25V, V _{GS} =0V, f=1.0MHZ | C _{oss} | - | 660 | - | |
| Reverse Transfer Capacitance V _{DS} =25V, V _{GS} =0V, f=1.0MHZ | C _{rSS} | - | 400 | - | |

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

| Characteristic | Symbol | Min | Typ | Max | Unit |
|----------------|--------|-----|-----|-----|------|
|----------------|--------|-----|-----|-----|------|

Switching

| | | | | | |
|---|---------------------|---|----|----|----|
| Turn-On Delay Time V _{DS} =15V, V _{GS} =10V, I _D =1A, R _G =3.3Ω, R _D =15Ω | T _{d(on)} | - | 16 | - | nS |
| Rise Time V _{DS} =15V, V _{GS} =10V, I _D =1A, R _G =3.3Ω, R _D =15Ω | T _r | - | 12 | - | |
| Turn-Off Time V _{DS} =15V, V _{GS} =10V, I _D =1A, R _G =3.3Ω, R _D =15Ω | T _{d(off)} | - | 96 | - | |
| Fall Time V _{DS} =15V, V _{GS} =10V, I _D =1A, R _G =3.3Ω, R _D =15Ω | T _f | - | 30 | - | |
| Total Gate Charge ³ V _{DS} =24V, V _{GS} =4.5V, I _D =18A | Q _g | - | 59 | 95 | nC |
| Gate-Source Charge V _{DS} =24V, V _{GS} =4.5V, I _D =18A | Q _{gs} | - | 10 | - | |
| Gate-Drain Charge V _{DS} =24V, V _{GS} =4.5V, I _D =18A | Q _{gd} | - | 23 | - | |

Source-Drain Diode Characteristics

| | | | | | |
|---|-----------------|---|----|-----|----|
| Forward On Voltage ³ V _{GS} =0V, I _S =18A | V _{SD} | - | - | 1.2 | V |
| Reverse Recovery Time ³ V _{GS} =0V, I _S =18A, di/dt=100A/μs | T _{rr} | - | 43 | - | nS |
| Reverse Recovery Charge V _{GS} =0V, I _S =18A, di/dt=100A/μs | Q _{rr} | - | 39 | - | nC |

Note: 1. Surface mounted on 1 in² copper pad of FR4 board; 125°C/W when mounted on Min. copper pad.

2. Pulse width limited by Max. junction temperature.

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

Characteristics Curve

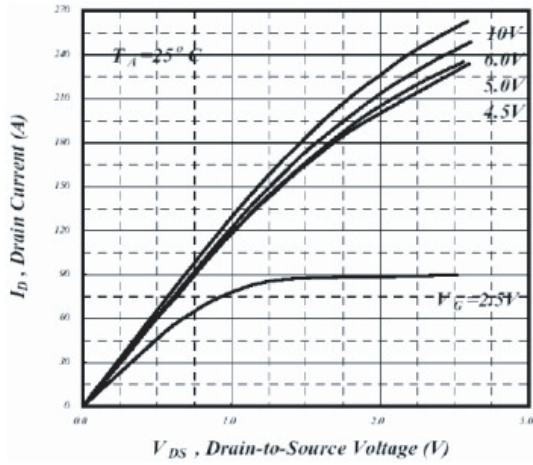


Fig 1. Typical Output Characteristics

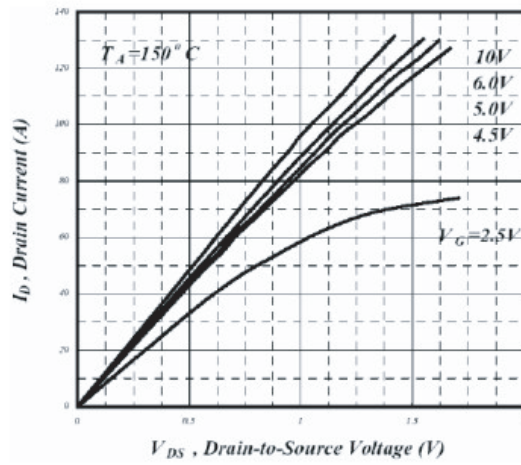


Fig 2. Typical Output Characteristics

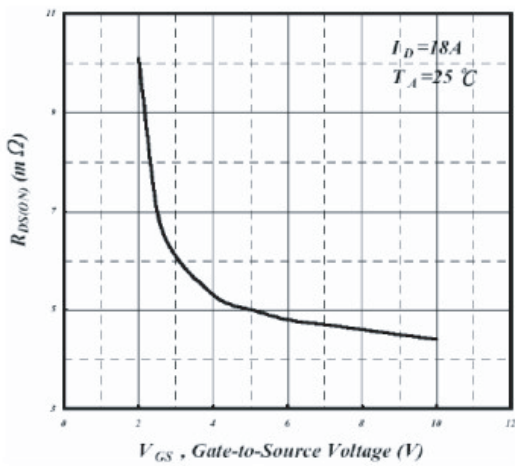


Fig 3. On-Resistance v.s. Gate Voltage

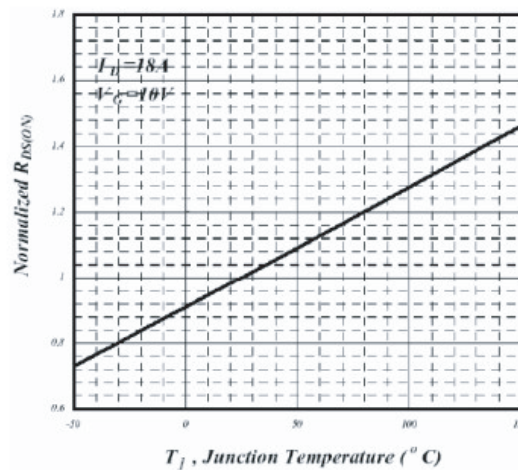


Fig 4. Normalized On-Resistance v.s. Junction Temperature

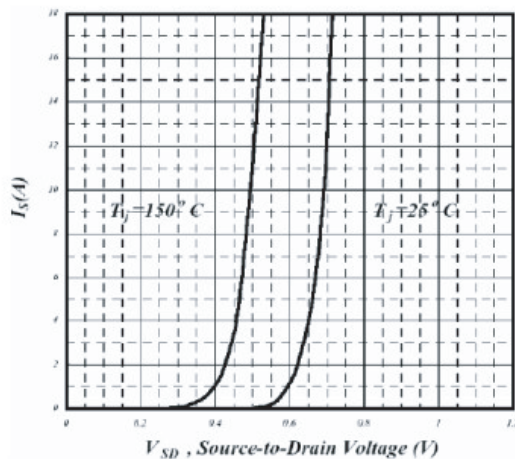


Fig 5. Forward Characteristics of Reverse Diode

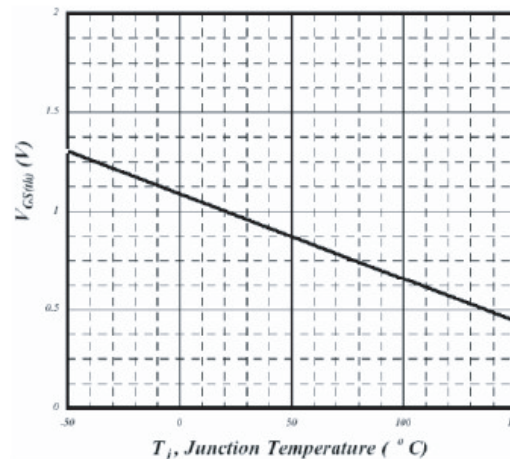


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

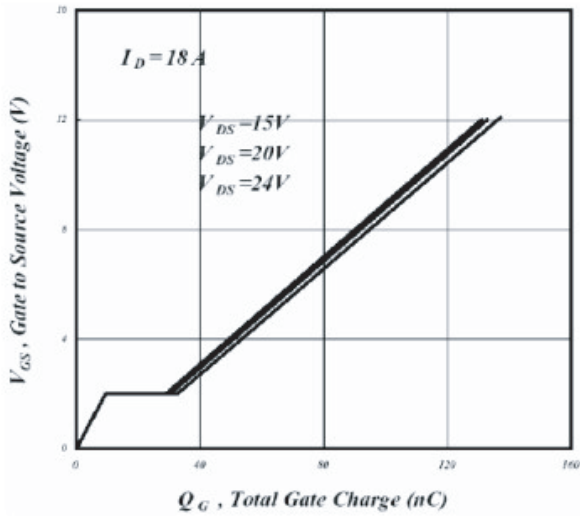


Fig 7. Gate Charge Characteristics

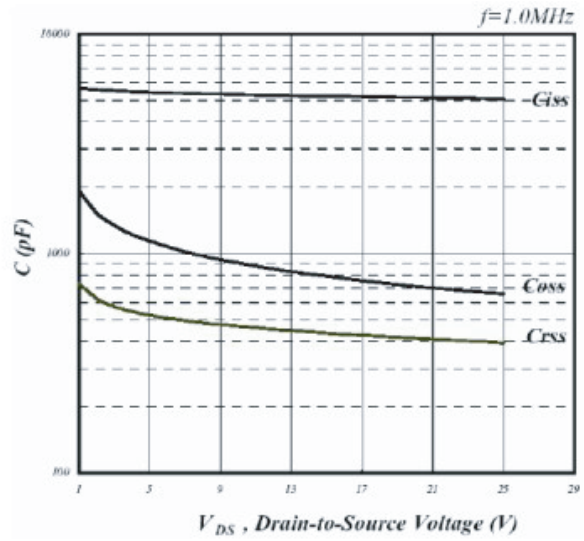


Fig 8. Typical Capacitance Characteristics

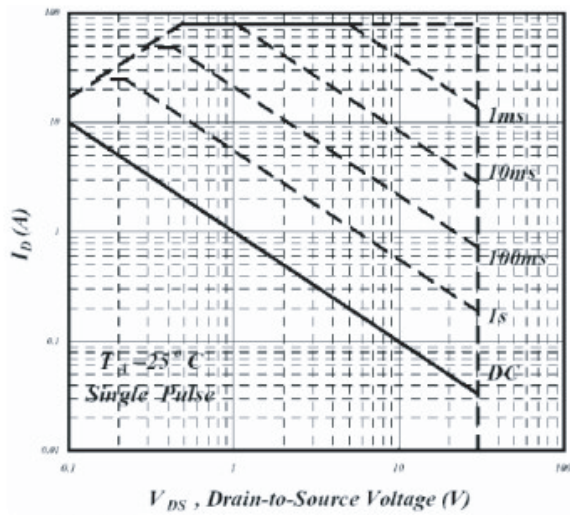


Fig 9. Maximum Safe Operating Area

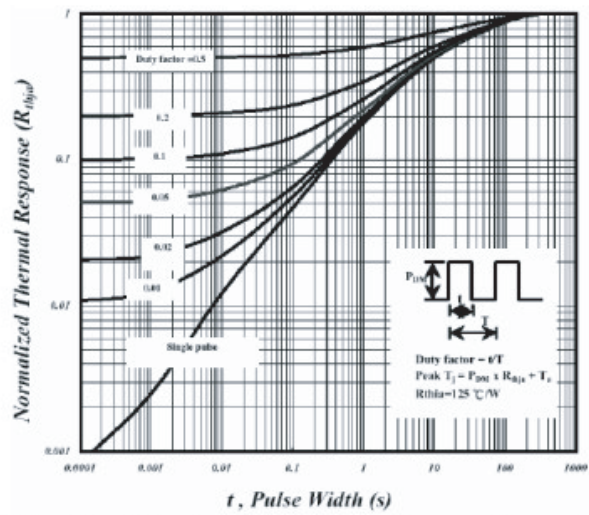


Fig 10. Effective Transient Thermal Impedance

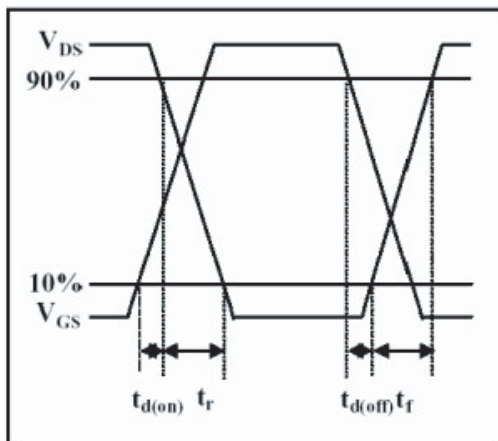


Fig 11. Switching Time Waveform

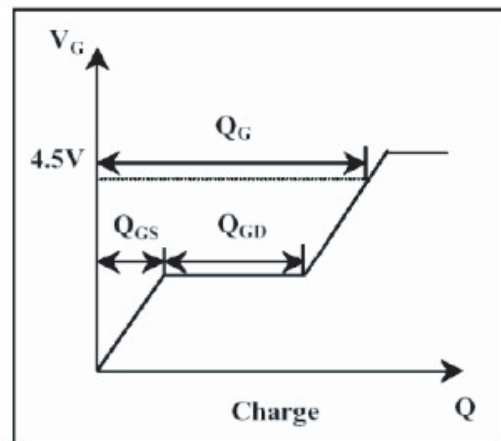
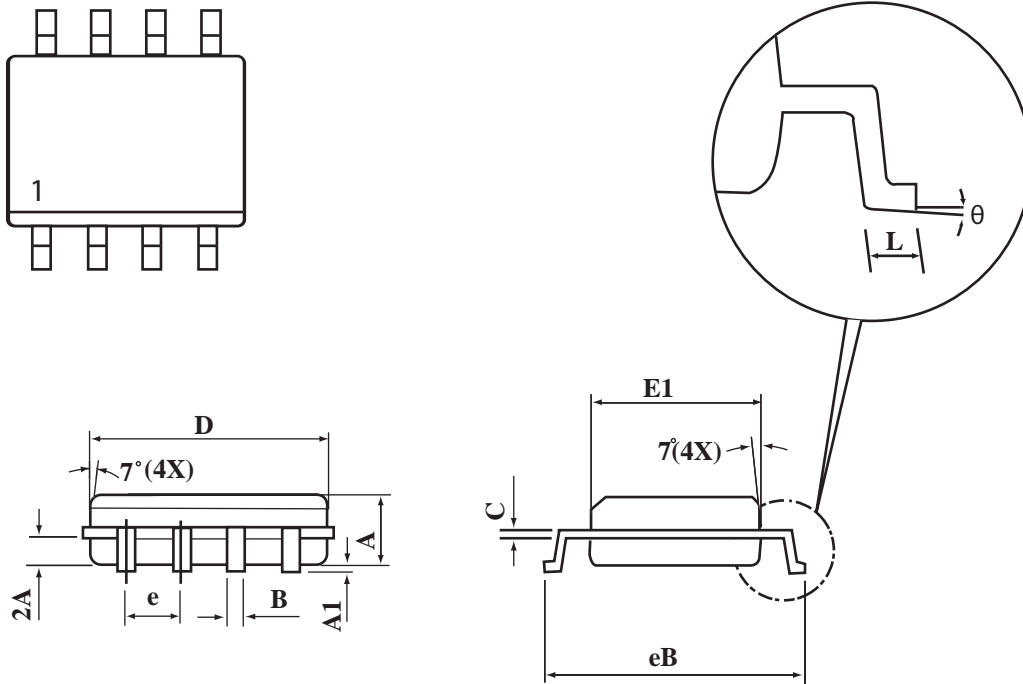


Fig 12. Gate Charge Waveform

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 | 1.27BSC | |
| L | 0.60 | 0.80 |
| θ | 0° | 8° |