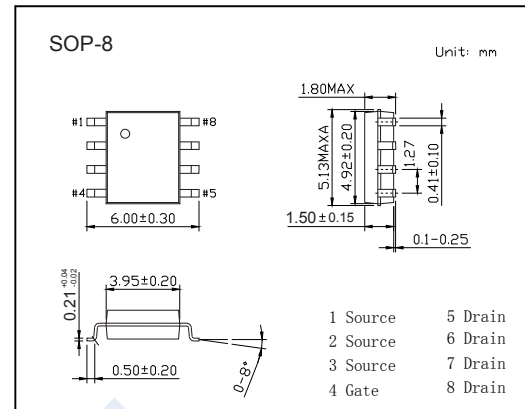
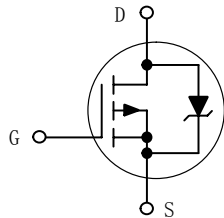


P-Channel MOSFET

NTMS10P02R2 (KTMS10P02R2)

■ Features

- $V_{DS}(V) = -20V$
- $I_D = -10 A$ ($V_{GS} = -10V$)
- $R_{DS(ON)} < 14 m\Omega$ ($V_{GS} = -4.5V$)
- $R_{DS(ON)} < 20m\Omega$ ($V_{GS} = -2.5V$)
- Diode Exhibits High Speed, Soft Recovery



■ Absolute Maximum Ratings $T_a = 25^\circ C$

| Parameter | | Symbol | 10 seconds | steady state | Unit |
|---|--------------------|------------|------------|--------------|--------------|
| Drain-Source Voltage | | V_{DS} | -20 | | V |
| Gate-Source Voltage | | V_{GS} | ± 12 | | |
| Continuous Drain Current | $T_a = 25^\circ C$ | I_D | -10 | -8.8 | A |
| | $T_a = 70^\circ C$ | | -8 | -6.4 | |
| Maximum Operating Drain Current | | | -5.5 | -4.5 | |
| Pulsed Drain Current (Note.1) | | I_{DM} | -50 | -44 | |
| Power Dissipation | $T_a = 25^\circ C$ | P_D | 2.5 | 1.6 | W |
| Maximum Operating Power Dissipation | | | 0.6 | 0.4 | |
| Avalanche Energy (Note.2) | $T_J = 25^\circ C$ | EAS | 500 | | mJ |
| Thermal Resistance.Junction- to-Ambient | | R_{thJA} | 50 | 80 | $^\circ C/W$ |
| Junction Temperature | | T_J | 150 | | $^\circ C$ |
| Lead Temperature for Soldering Purposes | | T_L | 260 | | |
| Junction Storage Temperature Range | | T_{stg} | -55 to 150 | | |

Note.1: Pulse Test: Pulse Width < 300us, Duty Cycle < 2%.

Note.2: $V_{DD} = -20 V$, $V_{GS} = -4.5V$, Peak $I_L = 5A$, $L = 40 mH$, $R_G = 25\Omega$

P-Channel MOSFET

NTMS10P02R2 (KTMS10P02R2)

■ Electrical Characteristics Ta = 25°C

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---------------------------------------|---------------------|---|------|-------|------|------|
| Drain-Source Breakdown Voltage | V _{DSS} | I _D =-250 μA, V _{GS} =0V | -20 | | | V |
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DSS} =-20V, V _{GS} =0V, T _J =25°C | | | -1 | μA |
| | | V _{DSS} =-20V, V _{GS} =0V, T _J =70°C | | | -5 | |
| Gate-Body leakage current | I _{GSS} | V _{DSS} =0V, V _{GS} =±12V | | | ±100 | nA |
| Gate Threshold Voltage | V _{GS(th)} | V _{DSS} =V _{GS} I _D =-250 μA | -0.6 | | -1.2 | V |
| Static Drain-Source On-Resistance | R _{DS(on)} | V _{GS} =-4.5V, I _D =-10A | | | 14 | mΩ |
| | | V _{GS} =-2.5V, I _D =-8.8A | | | 20 | |
| Forward Transconductance | g _{FS} | V _{DSS} =-10V, I _D =-10A | | 30 | | S |
| Input Capacitance | C _{iss} | V _{GS} =0V, V _{DS} =-16V, f=1MHz | | 3100 | 3640 | pF |
| Output Capacitance | C _{oss} | | | 1100 | 1670 | |
| Reverse Transfer Capacitance | C _{rss} | | | 475 | 1010 | |
| Total Gate Charge | Q _g | V _{GS} =-4.5V, V _{DS} =-10V, I _D =-10A | | 48 | 70 | nC |
| Gate Source Charge | Q _{gs} | | | 6.5 | | |
| Gate Drain Charge | Q _{gd} | | | 17 | | |
| Turn-On DelayTime | t _{d(on)} | V _{GS} =-4.5V, V _{DS} =-10V, I _D =1A, R _G =6 Ω | | 25 | 35 | ns |
| Turn-On Rise Time | t _r | | | 40 | 65 | |
| Turn-Off DelayTime | t _{d(off)} | | | 110 | 190 | |
| Turn-Off Fall Time | t _f | | | 110 | 190 | |
| Turn-On DelayTime | t _{d(on)} | V _{GS} =-4.5V, V _{DS} =-10V, I _D =10A, R _G =6 Ω | | 25 | | |
| Turn-On Rise Time | t _r | | | 100 | | |
| Turn-Off DelayTime | t _{d(off)} | | | 100 | | |
| Turn-Off Fall Time | t _f | | | 125 | | |
| Body Diode Reverse Recovery Time | t _{rr} | I _F =-2.1A, V _{GS} =0, di/dt=100A/μs | | 65 | 100 | |
| | t _a | | | 25 | | |
| | t _b | | | 40 | | |
| Body Diode Reverse Recovery Charge | Q _{rr} | | | 75 | | nC |
| Maximum Body-Diode Continuous Current | I _S | | | | -10 | A |
| Diode Forward Voltage | V _{SD} | I _S =-2.1A, V _{GS} =0V | | -0.72 | -1.2 | V |
| | | I _S =-2.1A, V _{GS} =0V, T _J =125°C | | -0.6 | | |
| | | I _S =-10A, V _{GS} =0V | | -0.9 | | |
| | | I _S =-10A, V _{GS} =0V, T _J =125°C | | -0.75 | | |

■ Marking

| | |
|---------|-----------------|
| Marking | 10P02 KC**** |
|---------|-----------------|

P-Channel MOSFET

NTMS10P02R2 (KTMS10P02R2)

■ Typical Characteristics

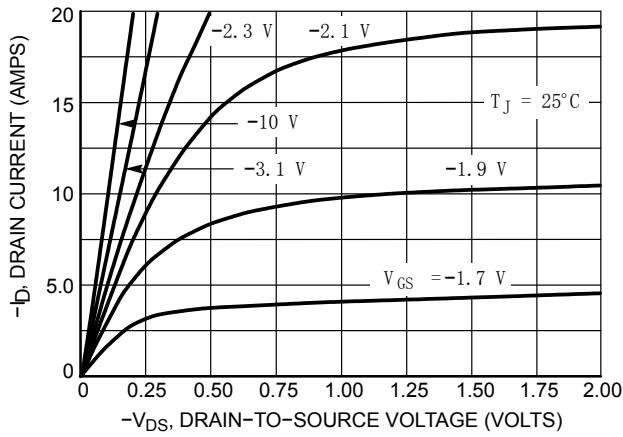


Figure 1. On-Region Characteristics

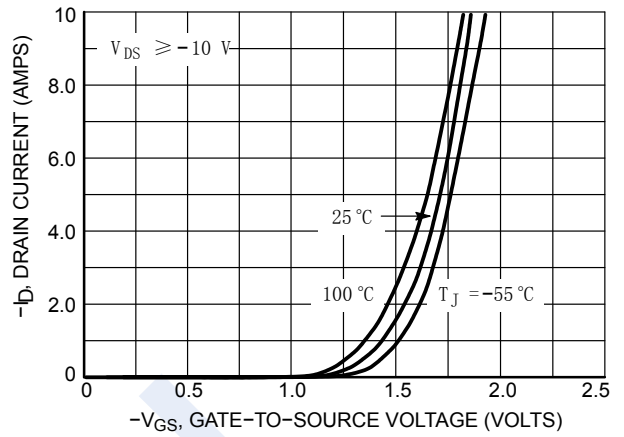


Figure 2. Transfer Characteristics

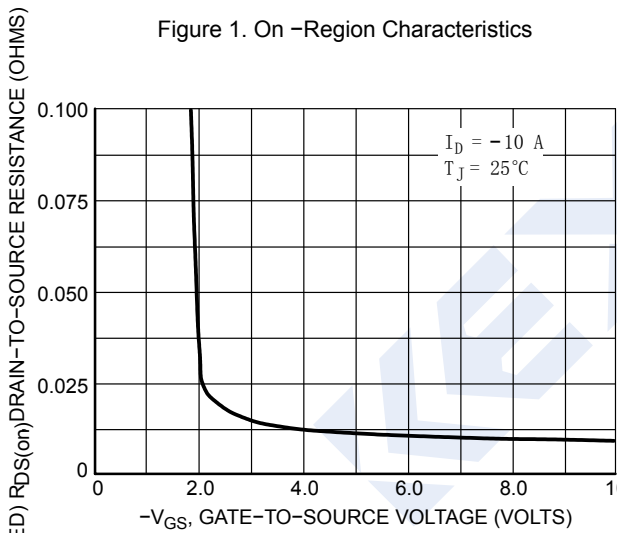


Figure 3. On-Resistance versus Gate-To-Source Voltage

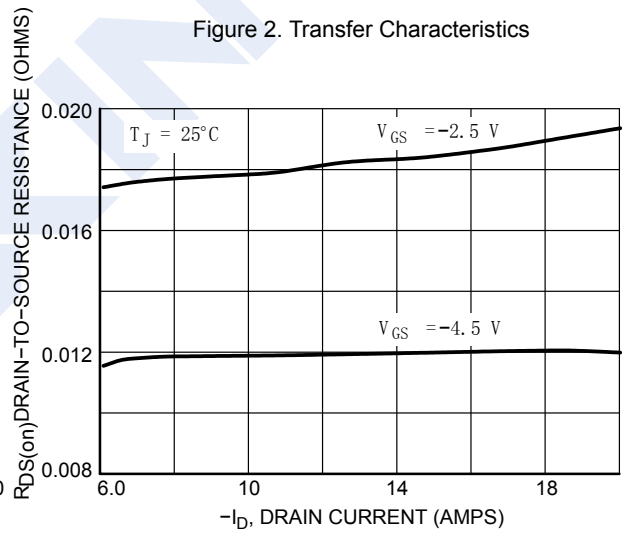


Figure 4. On-Resistance versus Drain Current and Gate Voltage

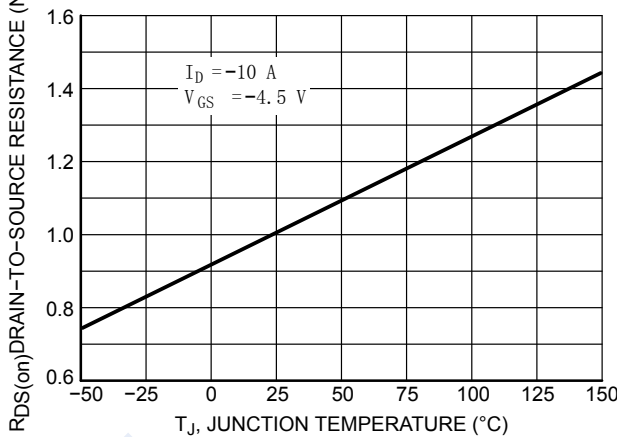


Figure 5. On-Resistance Variation with Temperature

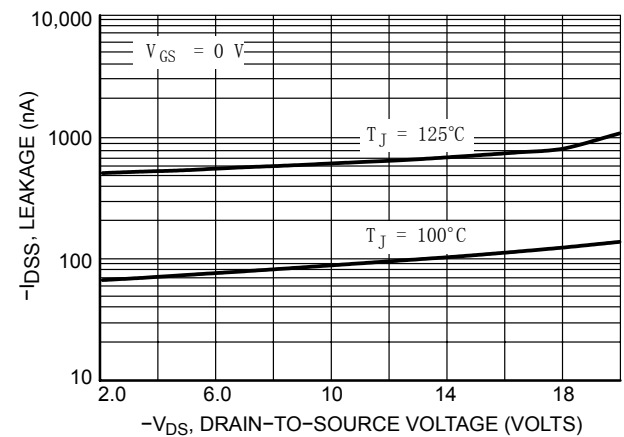


Figure 6. Drain-To-Source Leakage Current versus Voltage

P-Channel MOSFET NTMS10P02R2 (KTMS10P02R2)

■ Typical Characteristics

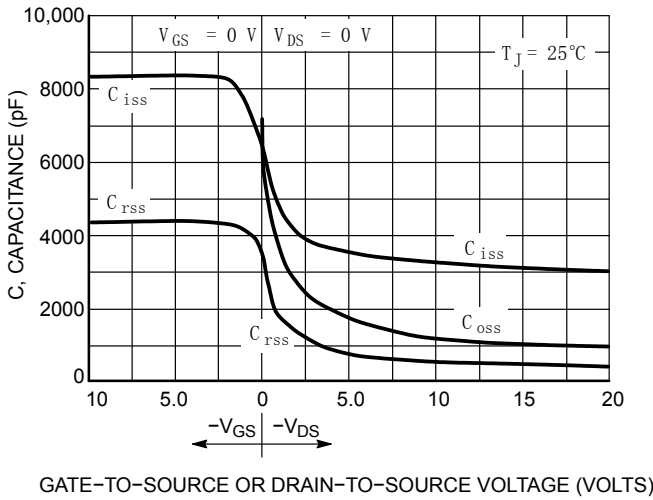


Figure 7. Capacitance Variation

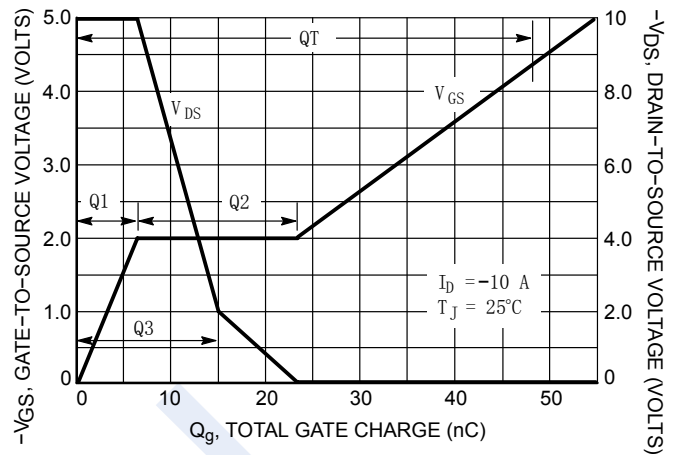


Figure 8. Gate -To-Source and Drain -To-Source Voltage versus Total Charge

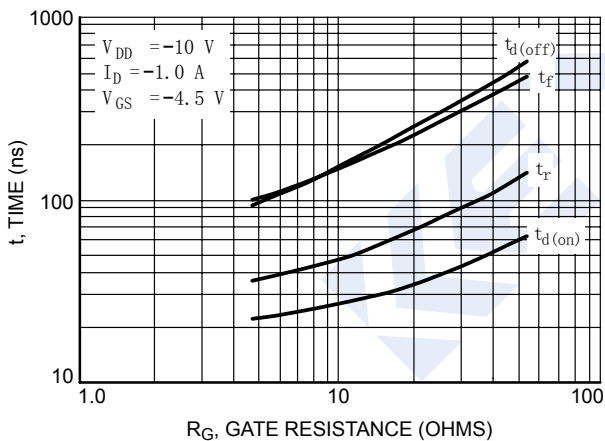


Figure 9. Resistive Switching Time Variation versus Gate Resistance

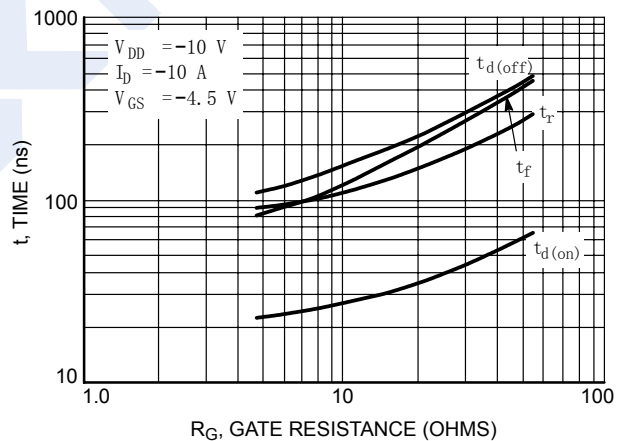


Figure 10. Resistive Switching Time Variation versus Gate Resistance

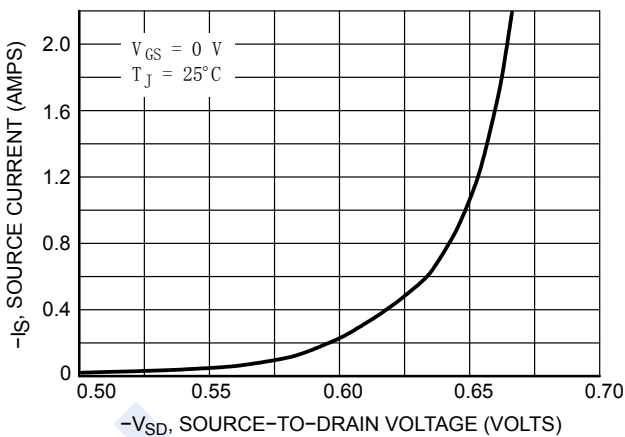


Figure 11. Diode Forward Voltage versus Current

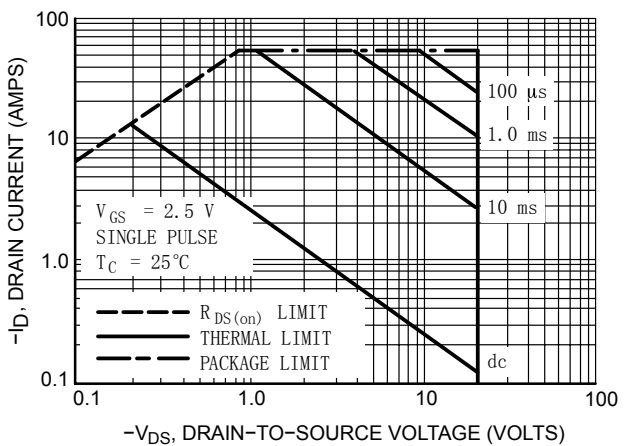


Figure 12. Maximum Rated Forward Biased Safe Operating Area

P-Channel MOSFET NTMS10P02R2 (KTMS10P02R2)

■ Typical Characteristics

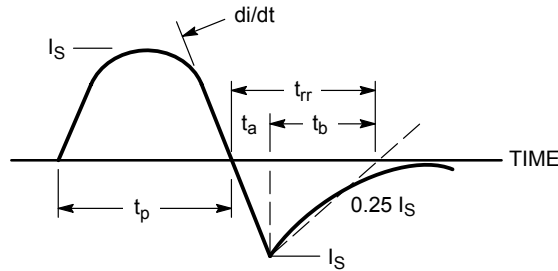


Figure 13. Diode Reverse Recovery Waveform

TYPICAL ELECTRICAL CHARACTERISTICS

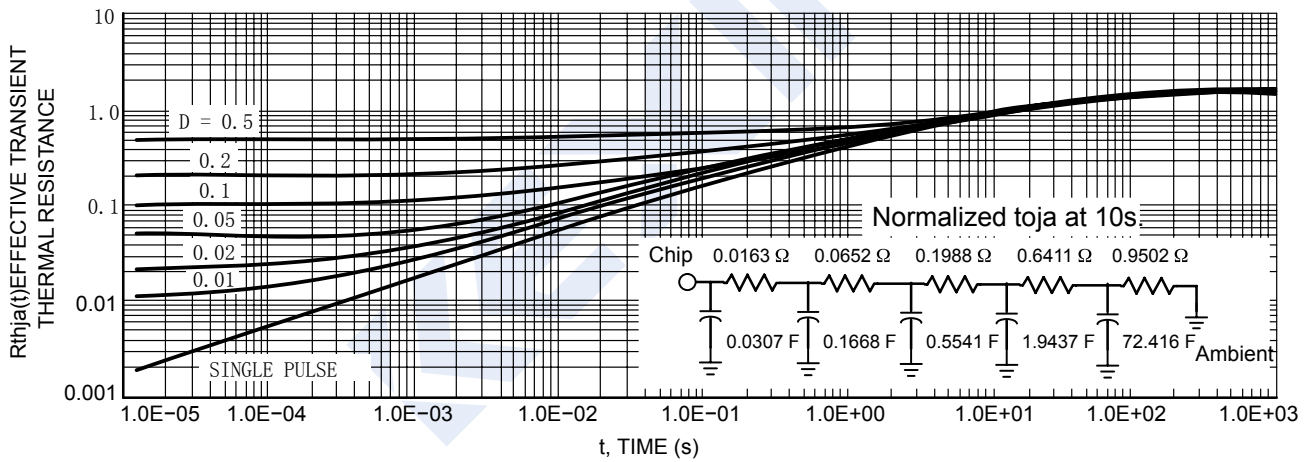


Figure 14. Thermal Response