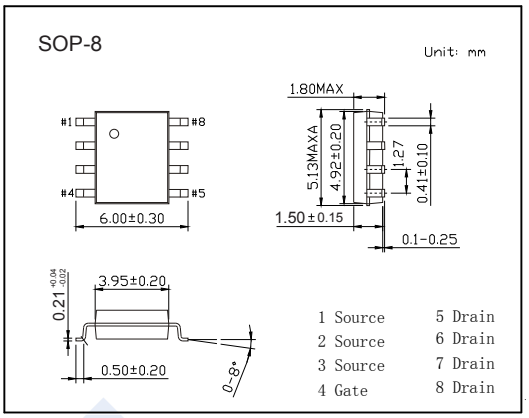
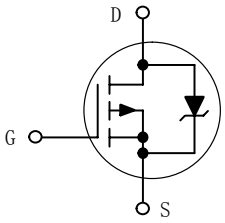
P-Channel MOSFET

NTMS10P02R2 (KTMS10P02R2)



■ Features

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



■ Absolute Maximum Ratings Ta = 25℃

Parameter		Symbol	10 seconds	steady state	Unit
Drain-Source Voltage		V_{DS}	-20		V
Gate-Source Voltage		V_{GS}	±12		
Continuous Drain Current	Ta = 25℃	I_D	-10	-8.8	A
	Ta = 70℃		-8	-6.4	
Maximum Operating Drain Current			-5.5	-4.5	
Pulsed Drain Current (Note.1)		I_{DM}	-50	-44	
Power Dissipation	Ta = 25℃	P_D	2.5	1.6	W
Maximum Operating Power Dissipation			0.6	0.4	
Avalanche Energy (Note.2)	T_J = 25°C	E_{AS}	500		mJ
Thermal Resistance.Junction- to-Ambient		R_{thJA}	50	80	℃/W
Junction Temperature		T_J	150		℃
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 = 25Ω

P-Channel MOSFET

NTMS10P02R2 (KTMS10P02R2)

■ Electrical Characteristics Ta = 25℃

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{DSS}	I_D=-250μA, V_{GS}=0V	-20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-20V, V_{GS}=0V, T_J=25℃			-1	μA
		V_{DS}=-20V, V_{GS}=0V, T_J=70℃			-5	
Gate-Body leakage current	I_{GSS}	V_{DS}=0V, V_{GS}=±12V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS} I_D=-250μA	-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_{DS}=-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=6Ω		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=6Ω		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℃		-0.6		
		I_S=-10A,V_{GS}=0V		-0.9		
		I_S=-10A,V_{GS}=0V,T_J = 125℃		-0.75		

■ Marking

Marking	10P02 KC****

P-Channel MOSFET

NTMS10P02R2 (KTMS10P02R2)

■ Typical Characterisitics

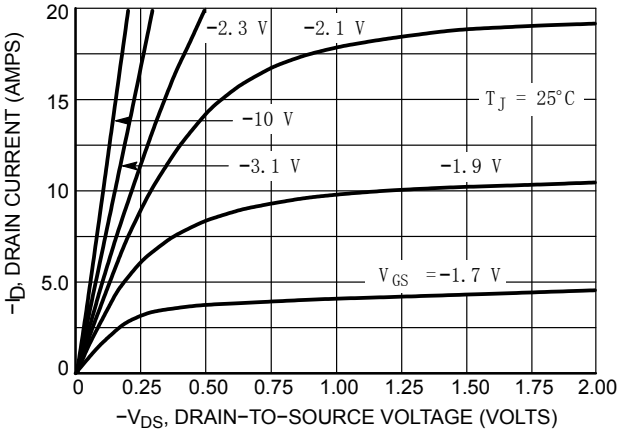


Figure 1. On -Region Characteristics

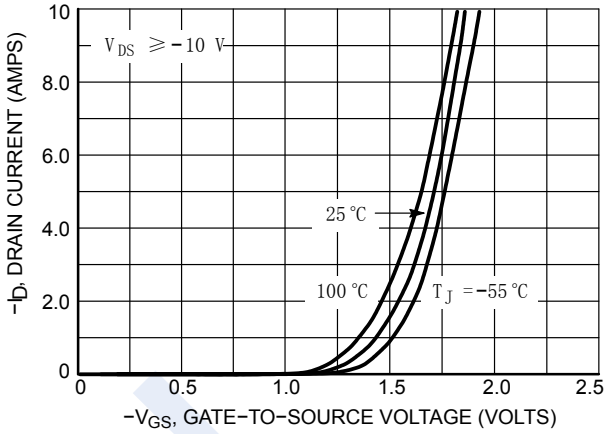


Figure 2. Transfer Characteristics

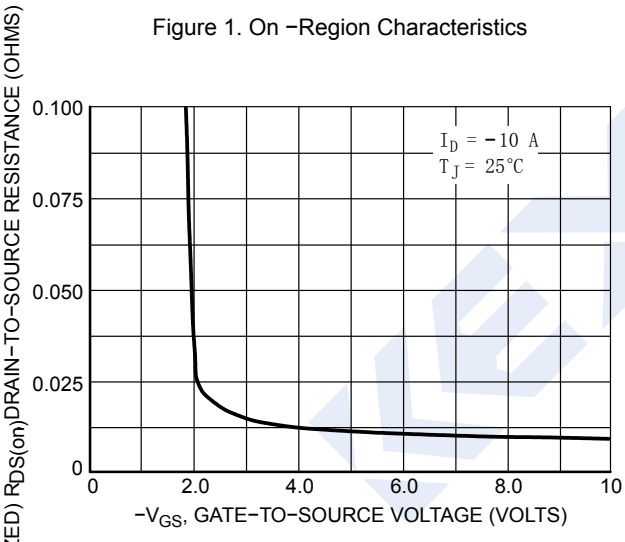


Figure 3. On -Resistance versus Gate-To-Source Voltage

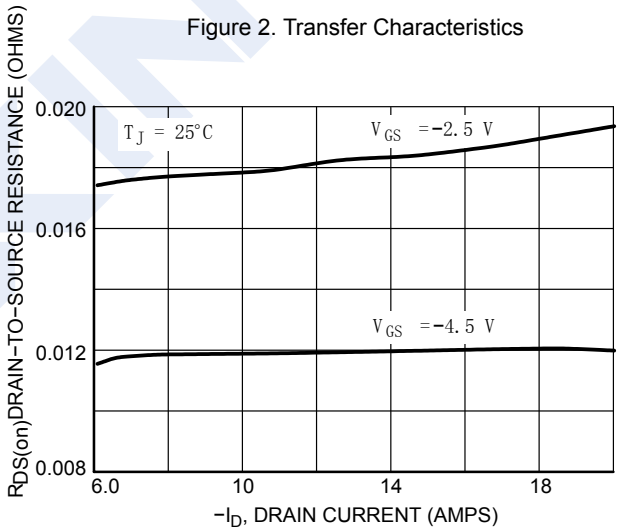


Figure 4. On-Resistance versus Drain Current and Gate Voltage

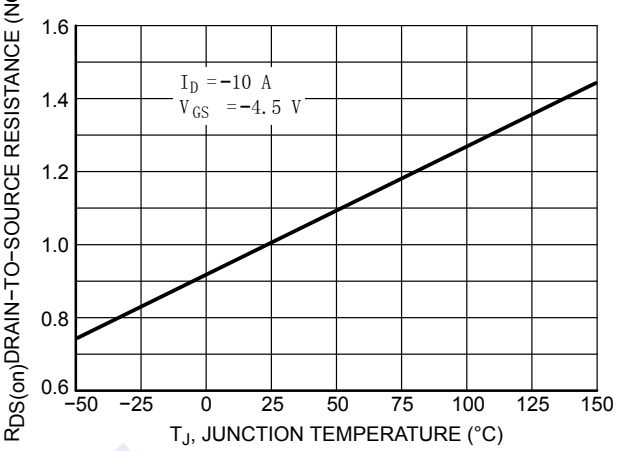


Figure 5. On -Resistance Variation with Temperature

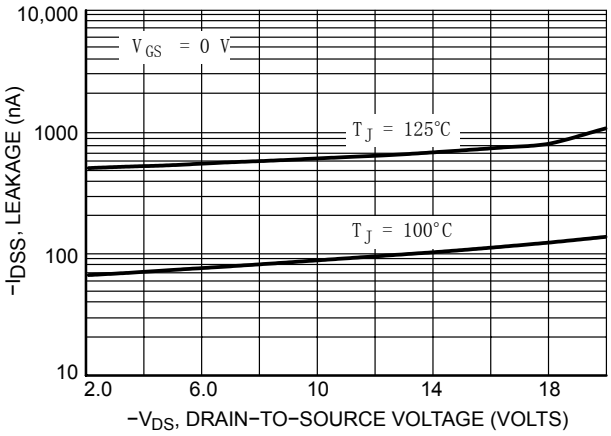


Figure 6. Drain -To-Source Leakage Current versus Voltage

P-Channel MOSFET

NTMS10P02R2 (KTMS10P02R2)

■ Typical Characterisitics

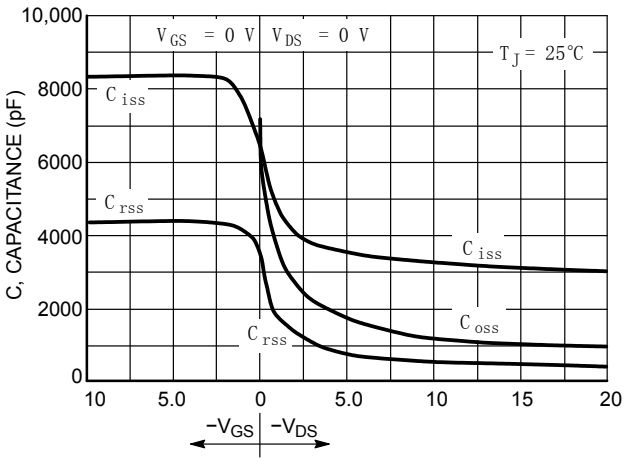


Figure 7. Capacitance Variation

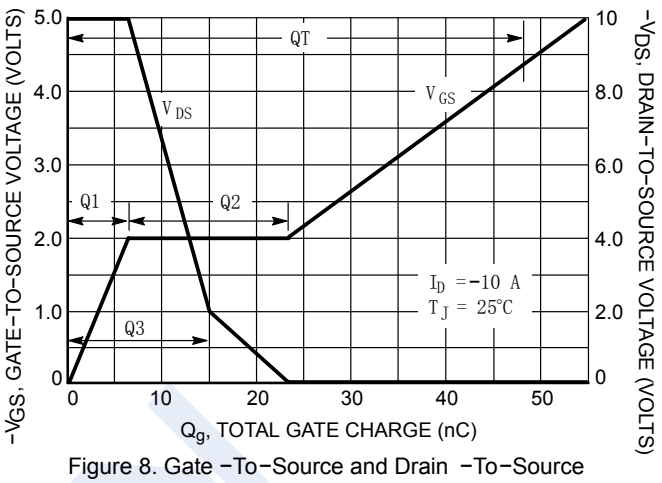


Figure 8. Gate -To-Source and Drain -To-Source Voltage versus Total Charge

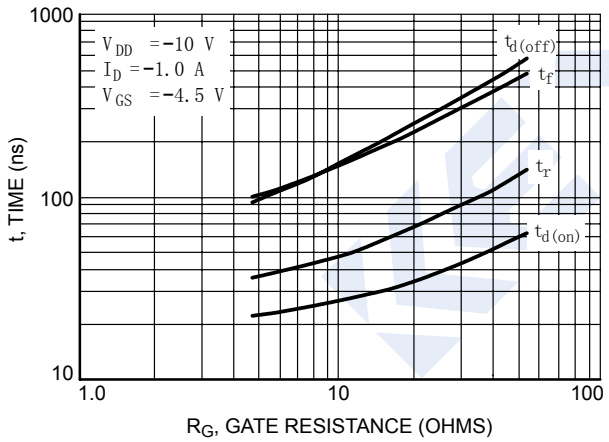


Figure 9. Resistive Switching Time Variation versus Gate Resistance

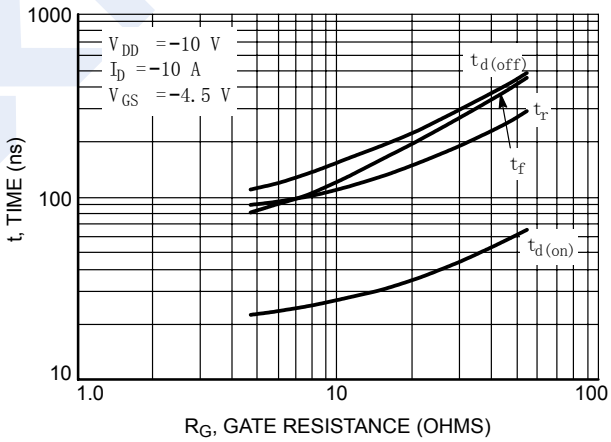


Figure 10. Resistive Switching Time Variation versus Gate Resistance

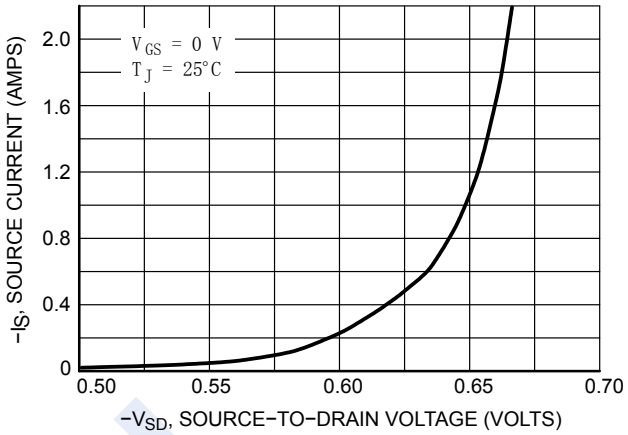


Figure 11. Diode Forward Voltage versus Current

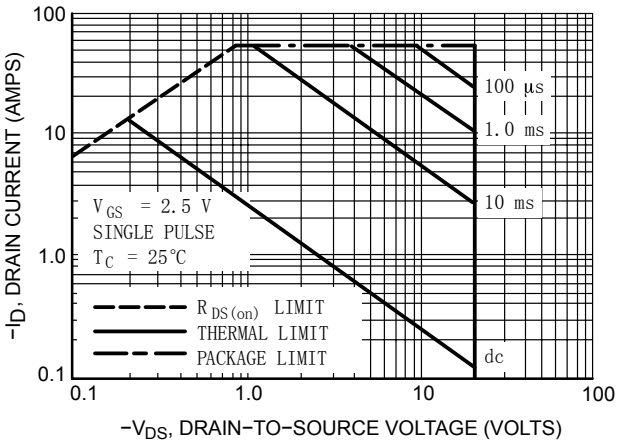


Figure 12. Maximum Rated Forward Biased Safe Operating Area

P-Channel MOSFET

NTMS10P02R2 (KTMS10P02R2)

■ Typical Characterisitics

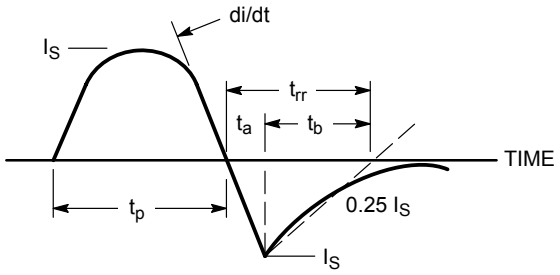


Figure 13. Diode Reverse Recovery Waveform

TYPICAL ELECTRICAL CHARACTERISTICS

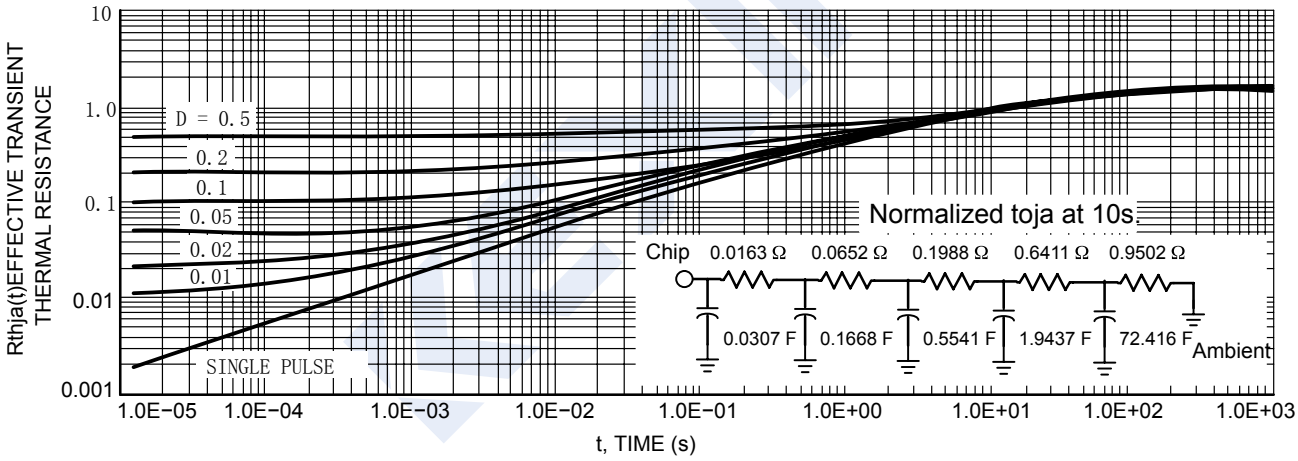


Figure 14. Thermal Response