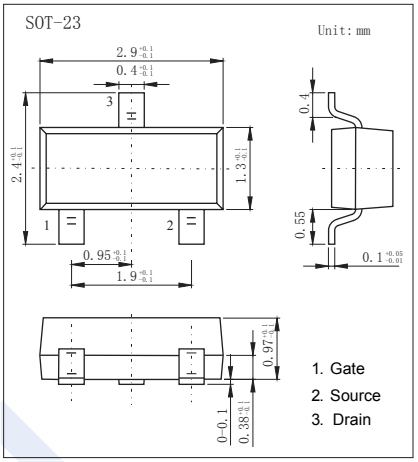
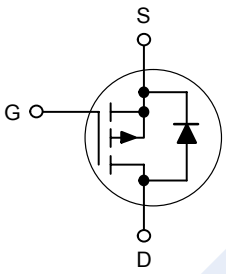
P-Channel MOSFET

NTR4101P (KTR4101P)



■ Features

- $V_{DS\ (V)}$ =-20V
- I_D =-3.2 A
- $R_{DS(ON)}$ < 85mΩ (V_{GS} =-4.5V)
- $R_{DS(ON)}$ < 120mΩ (V_{GS} =-2.5V)
- $R_{DS(ON)}$ < 210mΩ (V_{GS} =-1.8V)



■ Absolute Maximum Ratings Ta = 25℃

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	-20	V
Gate-Source Voltage		V_{GS}	±8	
Continuous Drain Current @Steady State (Note.1)	Ta = 25℃	I_D	-2.4	A
	Ta = 85℃		-1.7	
Continuous Drain Current @t ≤ 10s (Note.1)	Ta = 25℃		-3.2	
Power Dissipation (Note.1)	Steady State	P_D	0.73	W
	t ≤ 10s		1.25	
Continuous Drain Current (Note.2)	Ta = 25℃	I_D	-1.8	A
	Ta = 85℃		-1.3	
Power Dissipation (Note.2)		P_D	0.42	W
Pulsed Drain Current	tp = 10us	I_{DM}	-7.5	A
ESD Capability (Note 3)	C = 100 pF R_S = 1500Ω	ESD	225	V
Thermal Resistance.Junction- to-Ambient (Note.1)	Steady State	R_{thJA}	170	℃/W
	t ≤ 10 s		100	
Thermal Resistance.Junction- to-Ambient (Note.2)	Steady State		300	
Junction Temperature		T_J	150	℃
Junction Storage Temperature Range		T_{stg}	-55 to 150	

Note.1:Surface−mounted on FR4 board using 1 in sq pad size

Note.2:Surface−mounted on FR4 board using the minimum recommended pad size

Note.3:ESD Rating Information: HBM Class 0

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■ 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}=-16V, V_{GS}=0V			-1	μA
Gate-Body leakage current	I_{GSS}	V_{DS}=0V, V_{GS}=±8V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250μA	-0.4		-1.5	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=-4.5V, I_D=-1.6A			85	mΩ
		V_{GS}=-2.5V, I_D=-1.3A			120	
		V_{GS}=-1.8V, I_D=-0.9A			210	
Forward Transconductance	g_{FS}	V_{DS}=-5V, I_D=-2.3A	3			S
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=-10V, f=1MHz		675		pF
Output Capacitance	C_{oss}			100		
Reverse Transfer Capacitance	C_{rss}			75		
Gate resistance	R_g	V_{GS}=0V, V_{DS}=0V, f=1MHz		6.5		Ω
Total Gate Charge	Q_g	V_{GS}=-4.5V, V_{DS}=-10V, I_D=-1.6A		7.5	8.5	nC
Gate Source Charge	Q_{gs}			1.2		
Gate Drain Charge	Q_{gd}			2.2		
Turn-On DelayTime	$t_{d(on)}$	V_{GS}=-4.5V, V_{DS}=-10V,I_D=-1.6A,R_G=6Ω		7.5		ns
Turn-On Rise Time	t_r			12.6		
Turn-Off DelayTime	$t_{d(off)}$			30.2		
Turn-Off Fall Time	t_f			21		
Turn−On Delay Time	t_{rr}	I_F=-1.6A, dI/dt=100A/us,V_{GS}=0		12.8	15	
Reverse Recovery Time	t_a			9.9		
Discharge Time	t_b			3		
Reverse Recovery Charge	Q_{rr}			1008		nC
Maximum Body-Diode Continuous Current	I_S				-2.4	A
Diode Forward Voltage	V_{SD}	I_S=-2.4A,V_{GS}=0V			-1.2	V

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

■ Marking

Marking	TR4

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■ Typical Characterisitics

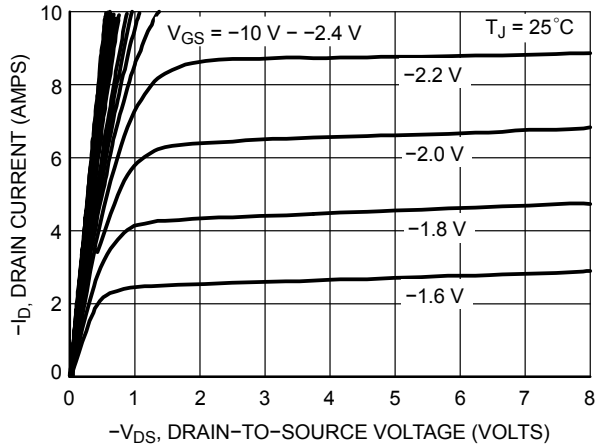

Figure 1. On−Region Characteristics

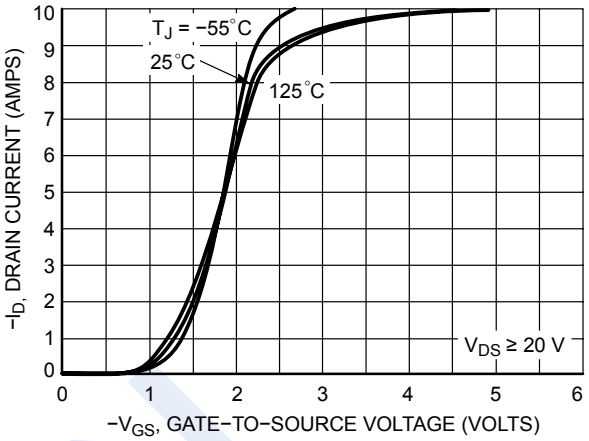

Figure 2. Transfer Characteristics

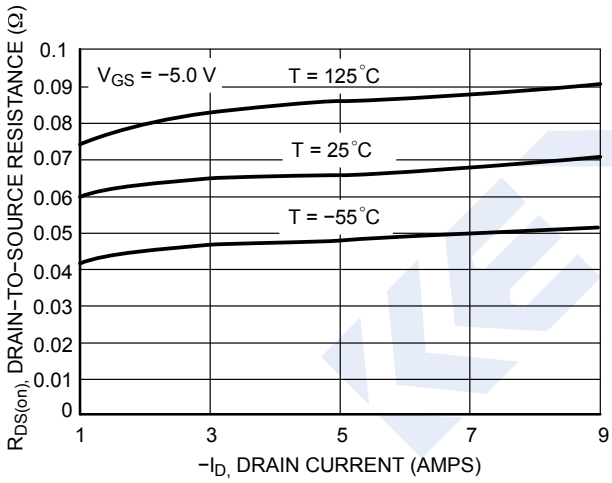

Figure 3. On−Resistance vs. Drain Current and Temperature

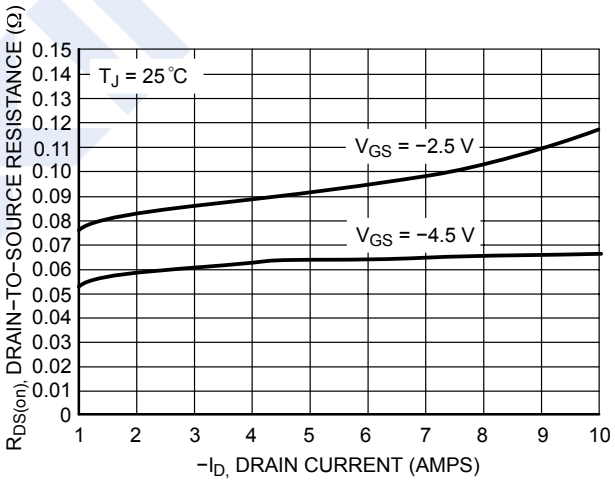

Figure 4. On−Resistance vs. Drain Current and Temperature

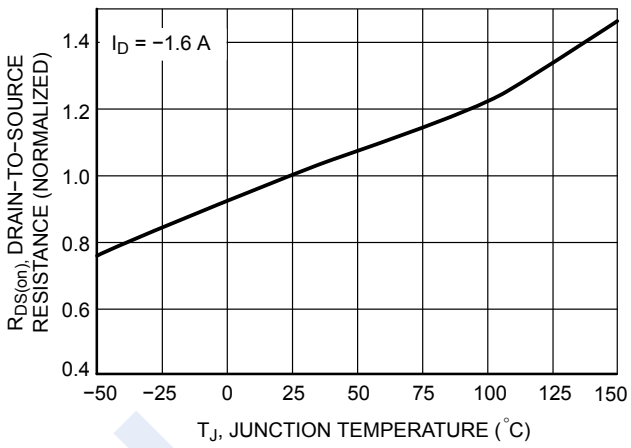

Figure 5. On−Resistance Variation with Temperature

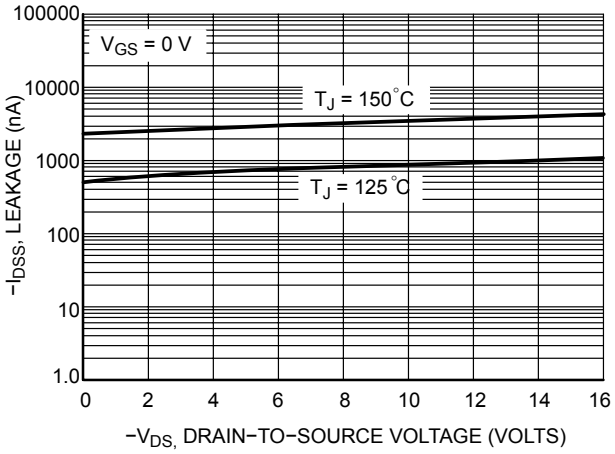

Figure 6. Drain−to−Source Leakage Current vs. Voltage

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■ Typical Characterisitics

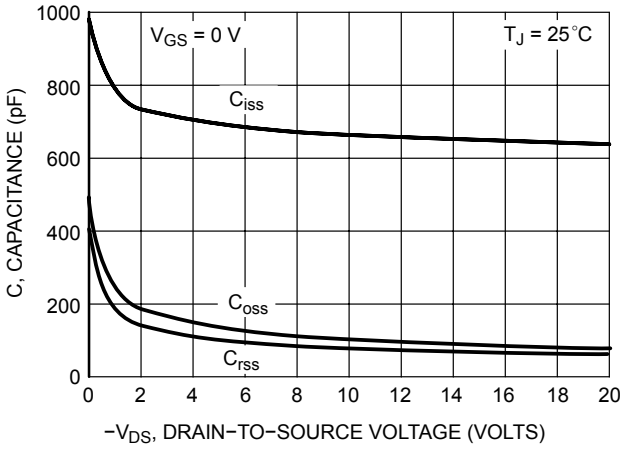

Figure 7. Capacitance Variation

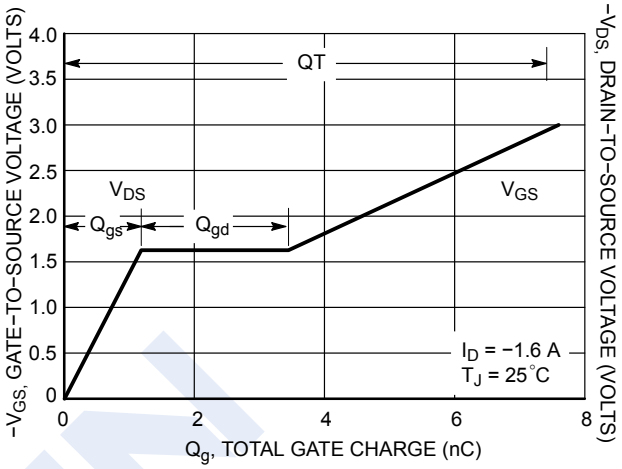

Figure 8. Gate−to−Source and Drain−to−Source Voltage vs. Total Gate Charge

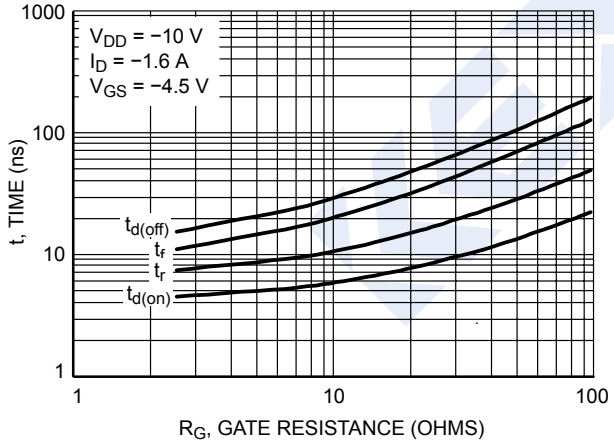

Figure 9. Resistive Switching Time Variation vs. Gate Resistance

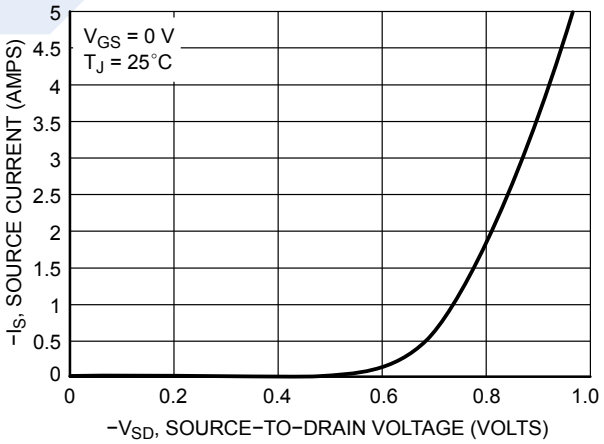

Figure 10. Diode Forward Voltage vs. Current