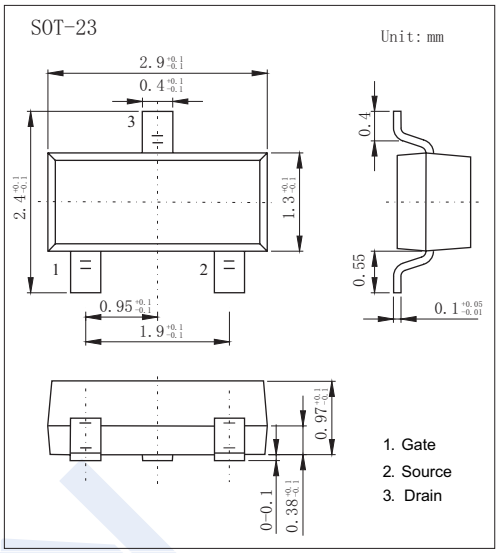
N-Channel Enhancement MOSFET

NTR4003N (KTR4003N)

■ Features

- $V_{DS\ (V)}$ = 30V
- I_D = 0.56 A (V_{GS} = ±20V)
- $R_{DS(ON)}$ < 1.5Ω (V_{GS} = 4V)
- $R_{DS(ON)}$ < 2Ω (V_{GS} = 2.5V)



■ Absolute Maximum Ratings Ta = 25℃

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current[1] Steady State	T_A=25℃	I_D	0.5	A
	T_A=85℃		0.37	
Continuous Drain Current[1] t < 10 s	T_A=25℃		0.56	
	T_A=85℃		0.4	
Pulsed Drain Current tp = 10 us		I_{DM}	1.7	
Power Dissipation[1] Steady State		P_D	0.69	W
Power Dissipation[1] t < 5 s			0.83	
Thermal Resistance.Junction- to-Ambient- Steady State[1]		R_{thJA}	180	℃/W
Thermal Resistance.Junction- to-Ambient- t < 10 s[1]			150	
Thermal Resistance.Junction- to-Ambient- Steady State[2]			300	
Lead Temperature for Soldering Purposes (1/8" from case for 10 s)		T_L	260	℃
Junction Temperature		T_J	150	
Storage Temperature Range		T_{stg}	-55 to 150	

Notes:1. Surface-mounted on FR4 board using 1 in sq pad size
(Cu area = 1.127 in sq [1 oz] including traces).
2. Surface-mounted on FR4 board using the minimum recommended pad size.

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■ Electrical Characteristics Ta = 25℃

Parameter	Symbol	Test Conditions		Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{DSS}	I_D=100μA, V_{GS}=0V		30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=30V, V_{GS}=0V, T_J=25℃				1	uA
Gate-Body Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±10V				±1	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS} , I_D=250μA		0.8		1.4	V
Drain−to−Source Breakdown Voltage Temperature Coefficient	V_{DSS}/T_J				40		mV/°C
Negative Threshold Temperature Coefficient	$V_{GS(th)}/T_J$				3.4		
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=4V, I_D=10mA				1.5	Ω
		V_{GS}=2.5V, I_D=10mA				2	
Forward Transconductance	g_{FS}	V_{DS}=3V, I_D=10mA			0.33		S
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=5V, f=1MHz			21		pF
Output Capacitance	C_{oss}				19.7		
Reverse Transfer Capacitance	C_{rss}				8.1		
Total Gate Charge	$Q_{g(TOT)}$	V_{GS}=5V, V_{DS}=24V, I_D=0.1A			1.15		nC
Threshold Gate Charge	$Q_{g(TH)}$				0.15		
Gate Source Charge	Q_{gs}				0.32		
Gate Drain Charge	Q_{gd}				0.23		
Turn-On DelayTime	$t_{d(on)}$	V_{GS}=4.5V, V_{DS}=5V, I_D=0.1A,R_{GEN}=50Ω			16.7		ns
Turn-On Rise Time	t_r				47.9		
Turn-Off DelayTime	$t_{d(off)}$				65.1		
Turn-Off Fall Time	t_f				64.2		
Body Diode Reverse Recovery Time	t_{rr}	I_S= 10mA, dIs/dt= 8A/μs			14		
Maximum Body-Diode Continuous Current	I_S					1	A
Diode Forward Voltage	V_{SD}	I_S=10mA,V_{GS}=0V	T_J=25℃			0.7	V
			T_J=125℃		0.45		

■ Marking

Marking	TR8M.

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■ Typical Characterisitics

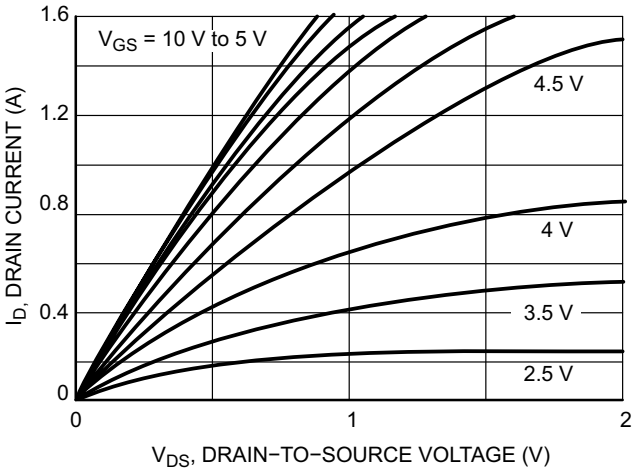

Figure 1. On−Region Characteristics

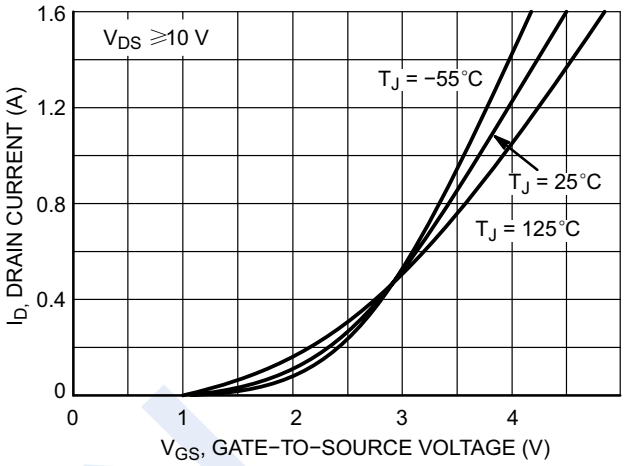

Figure 2. Transfer Characteristics

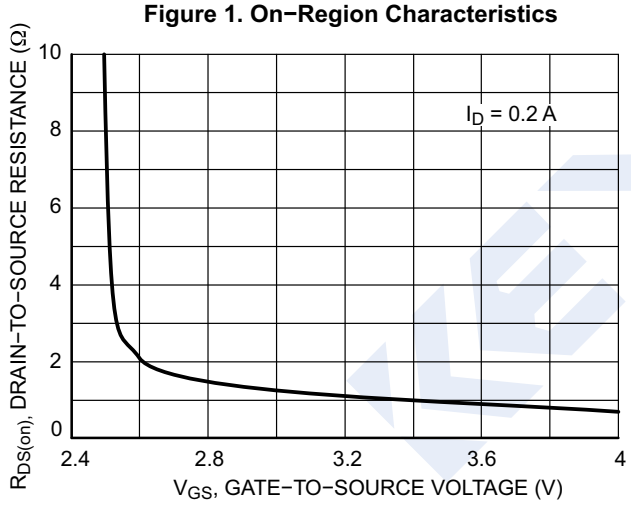

Figure 3. On−Resistance vs. Gate−to−Source Voltage

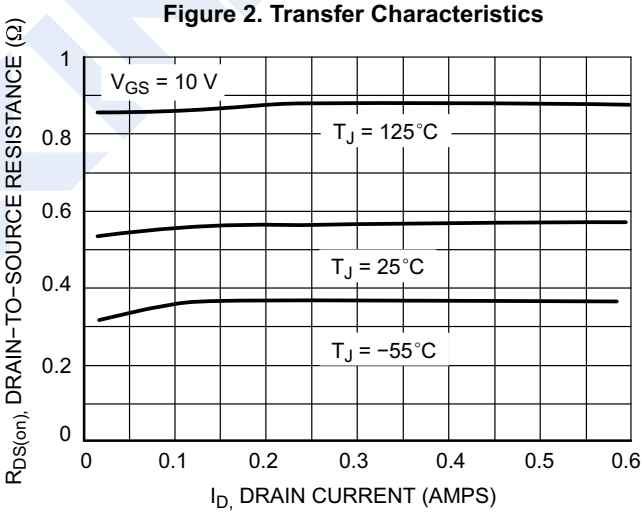

Figure 4. On−Resistance vs. Drain Current and Temperature

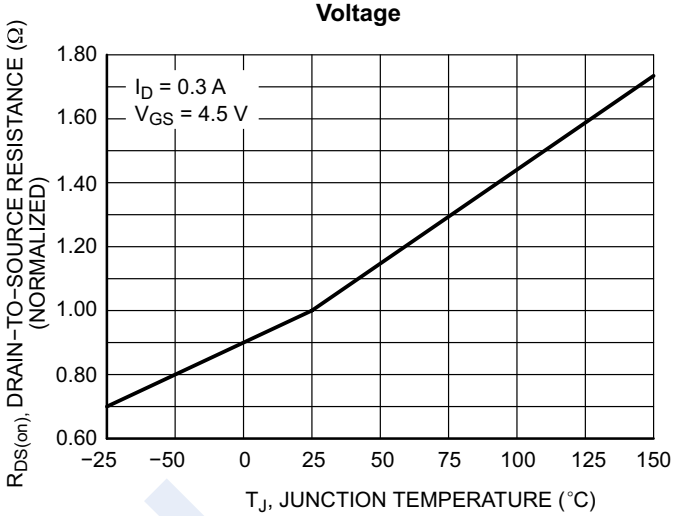

Figure 5. On−Resistance Variation with Temperature

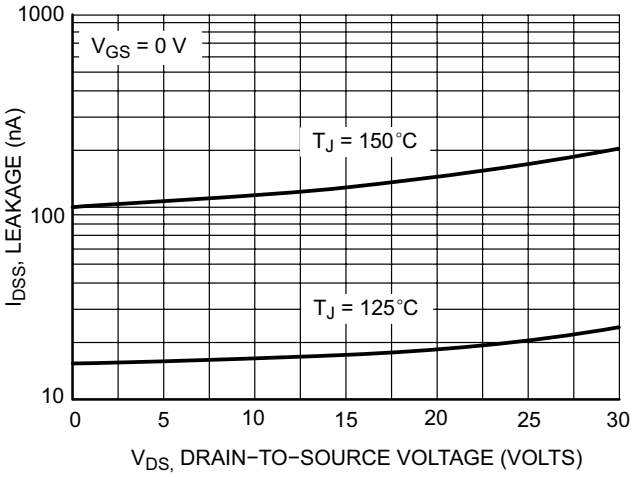

Figure 6. Drain−to−Source Leakage Current vs. Voltage

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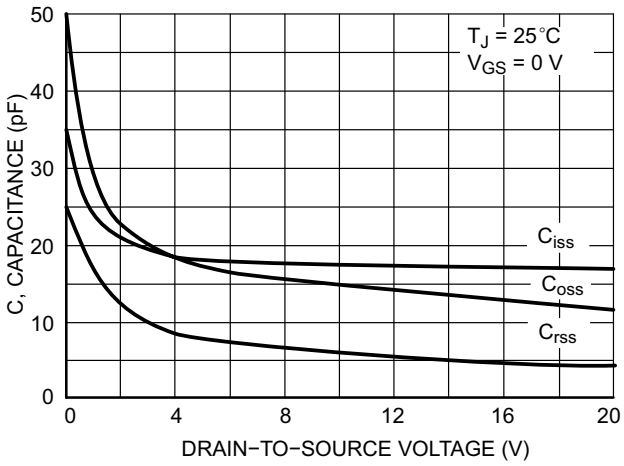

Figure 7. Capacitance Variation

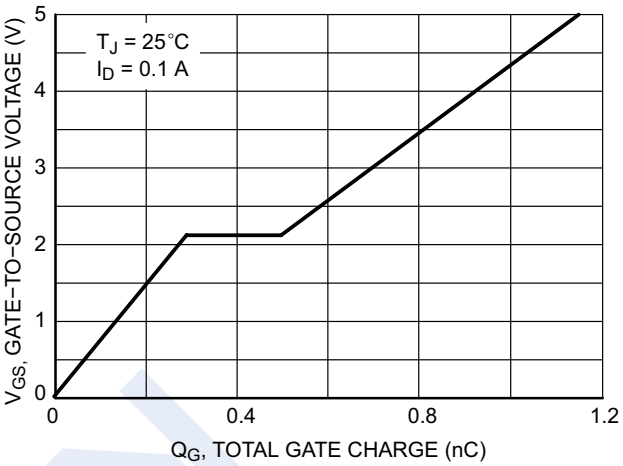

Figure 8. Gate−to−Source & Drain−to−Source Voltage vs. Total Charge

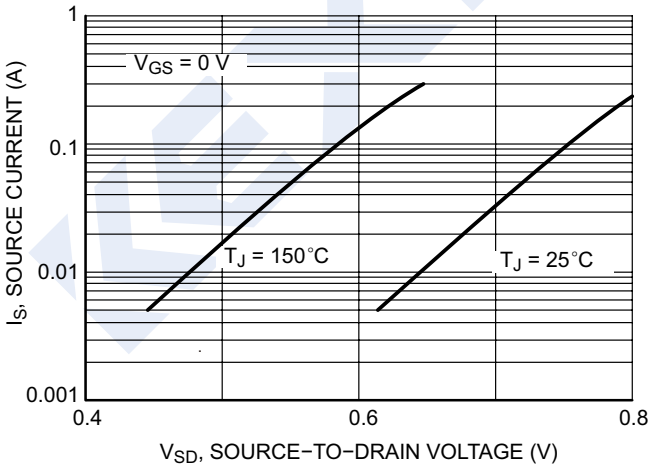

Figure 9. Diode Forward Voltage vs. Current