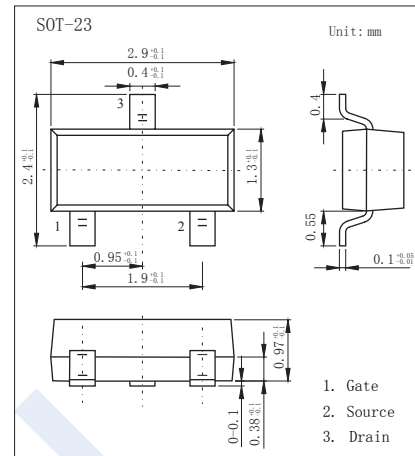


N-Channel MOSFET

NTR4501NT1G

■ Features

- $V_{DS} (V) = 20V$
- $I_D = 3.2 A (V_{GS} = 4.5V)$
- $R_{DS(ON)} < 70m\Omega (V_{GS} = 4.5V)$
- $R_{DS(ON)} < 85m\Omega (V_{GS} = 2.5V)$
- Leading Planar Technology for Low Gate Charge / Fast Switching
- 2.5 V Rated for Low Voltage Gate Drive



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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 12	
Continuous Drain Current (Note.1)	I_D	$T_A=25^\circ C$	3.2
		$T_A=85^\circ C$	2.4
Pulsed Drain Current @ $t_p=10\mu s$	I_{DM}	10	A
Power Dissipation (Note.1)	P_D	1.25	W
Thermal Resistance.Junction- to-Ambient (Note.1) (Note.2)	R_{thJA}	100	$^\circ C/W$
		300	
Lead Temperature for Soldering Purposes (Note.3)	T_L	260	$^\circ C$
Junction Temperature	T_J	150	
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: 1/8" from case for 10 s.

N-Channel MOSFET

NTR4501NT1G

■ 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 (Note.1)	20	24.5		V	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =16V, V _{GS} =0V, T _J =25°C			1.5	μA	
		V _{DS} =16V, V _{GS} =0V, T _J =85°C			10		
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 =250 μA (Note.1)	0.65		1.2	V	
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =4.5V, I _D =3.6A		70	80	mΩ	
		V _{GS} =2.5V, I _D =3.1A		85	105		
Forward Transconductance	g _{FS}	V _{DS} =5V, I _D =3.6A		9		S	
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =10V, f=1MHz		200		pF	
Output Capacitance	C _{oss}			80			
Reverse Transfer Capacitance	C _{rss}			50			
Total Gate Charge	Q _g	V _{GS} =4.5V, V _{DS} =10V, I _D =3.6A		2.4	6	nC	
Gate Source Charge	Q _{gs}			0.5			
Gate Drain Charge	Q _{gd}			0.6			
Turn-On DelayTime	t _{d(on)}	V _{GS} =4.5V, V _{DS} =10V, I _D =3.6A, R _G =6Ω (Note.2)		6.5		ns	
Turn-On Rise Time	t _r			12			
Turn-Off DelayTime	t _{d(off)}			12			
Turn-Off Fall Time	t _f			3			
Body Diode Reverse Recovery Time	t _{rr}			7.1			
Charge Time	t _a		I _S = 1.6A, di/dt= 100A/μs, V _{GS} =0		5		
Discharge Time	t _b				1.9		
Body Diode Reverse Recovery Charge	Q _{rr}		3		nC		
Maximum Body-Diode Continuous Current	I _S				1.6	A	
Diode Forward Voltage	V _{SD}	I _S =1.6A, V _{GS} =0V		0.8	1.2	V	

Note.1: Pulse Test: Pulse width ≤ 300 μs, duty cycle ≤ 2%.

Note.2: Switching characteristics are independent of operating junction temperatures.

■ Marking

Marking	TR1*
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N-Channel MOSFET NTR4501NT1G

■ Typical Characteristics

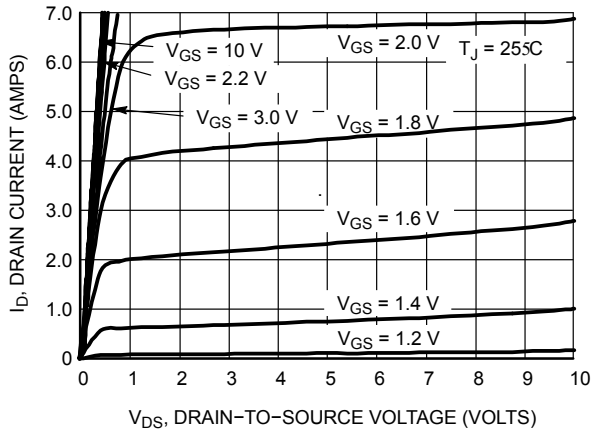


Figure 1. On-Region Characteristics

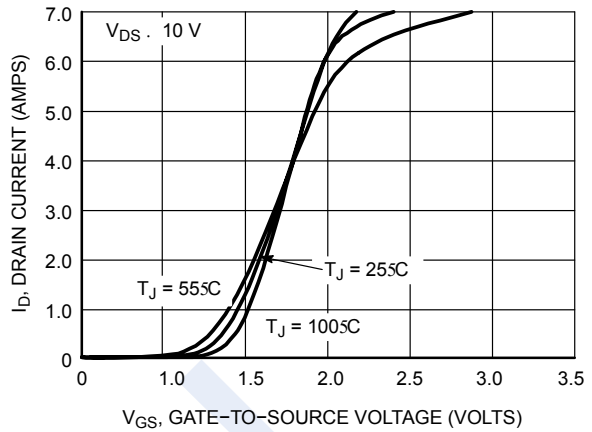


Figure 2. Transfer Characteristics

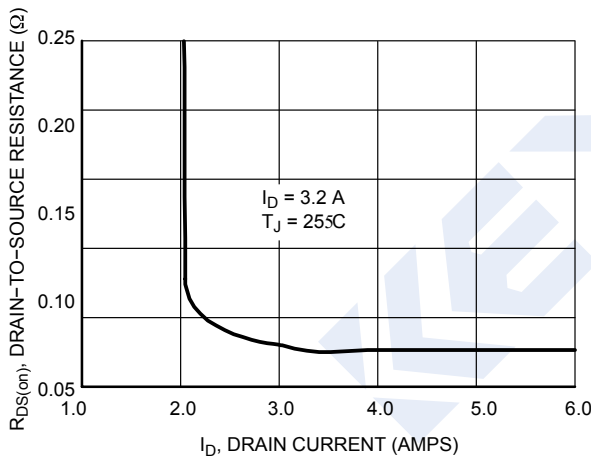


Figure 3. On-Resistance versus Gate-to-Source Voltage

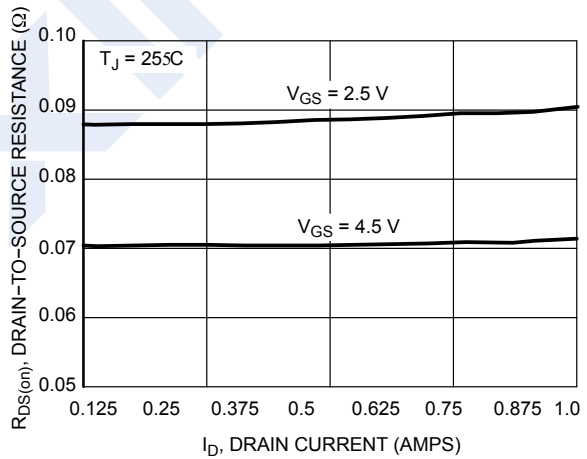


Figure 4. On-Resistance versus Drain Current and Gate Voltage

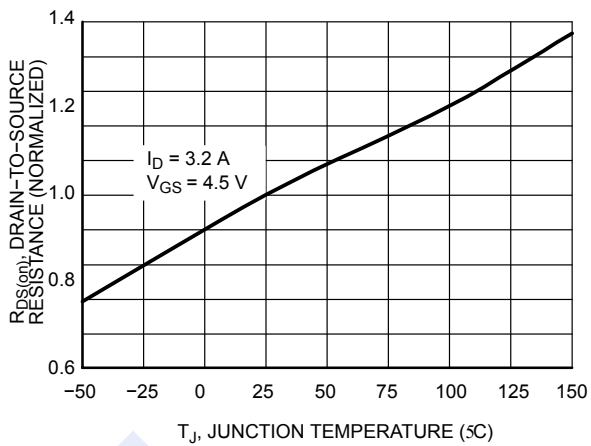


Figure 5. On-Resistance Variation with Temperature

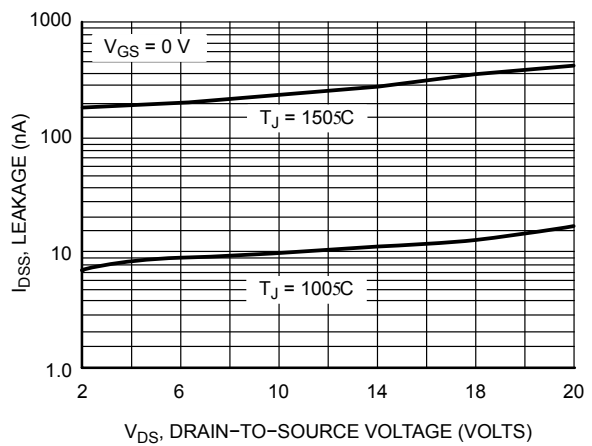


Figure 6. Drain-to-Source Leakage Current versus Voltage

N-Channel MOSFET NTR4501NT1G

■ Typical Characteristics

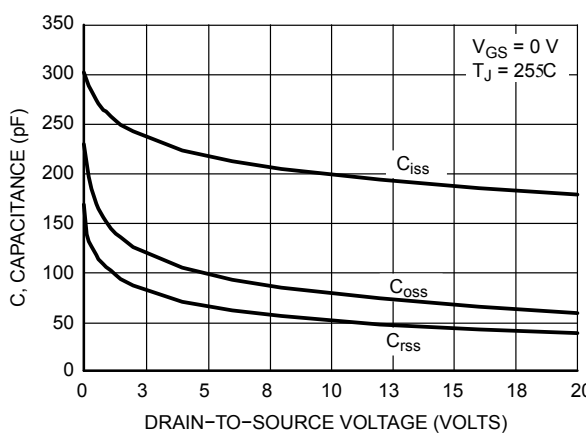


Figure 7. Capacitance Variation

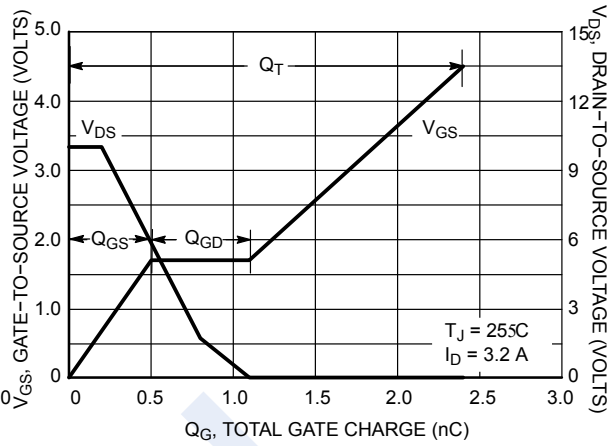


Figure 8. Gate-to-Source and Drain-to-Source Voltage versus Total Gate Charge

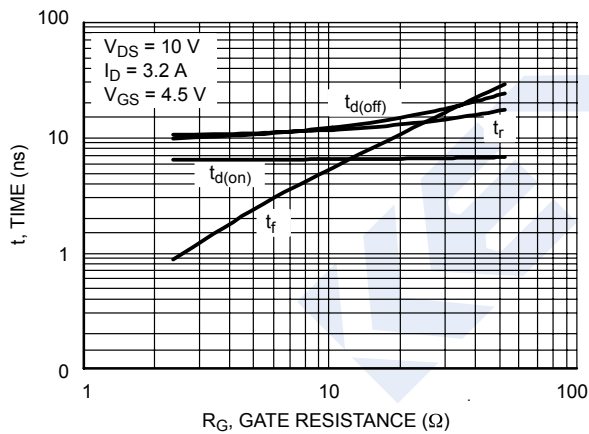


Figure 9. Resistive Switching Time Variation versus Gate Resistance

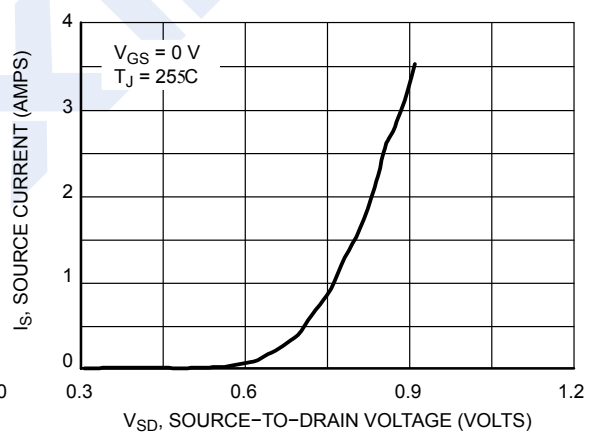


Figure 10. Diode Forward Voltage versus Current