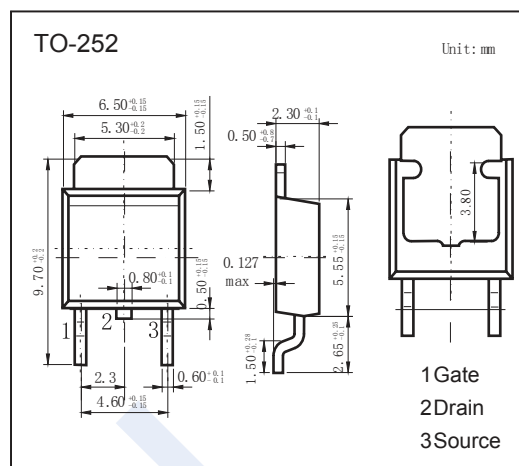
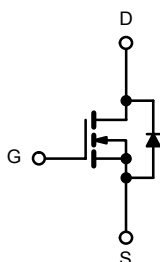


N-Channel MOSFET

NDT50N03

■ Features

- $V_{DS} (V) = 30V$
- $I_D = 90 A (V_{GS} = 10V)$
- $R_{DS(ON)} < 5.7m\Omega (V_{GS} = 10V)$
- $R_{DS(ON)} < 7.8m\Omega (V_{GS} = 4.5V)$



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

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current ($T_J = 70^\circ C$)	$T_c = 25^\circ C$ *1&5	I_D	90	A
	$T_c = 70^\circ C$ *1&5		75	
	$T_a = 25^\circ C$ *2&3		30	
	$T_a = 70^\circ C$ *2&3		25	
Pulsed Drain Current		I_{DM}	100	mJ
Avalanche Current Pulse	L=0.1mH	I_{AS}	45	
Single Pulse Avalanche Energy		E_{AS}	101	
Power Dissipation	$T_c = 25^\circ C$	P_D	83	W
	$T_c = 70^\circ C$		58	
	$T_a = 25^\circ C$ *2&3		10	
	$T_a = 70^\circ C$ *2&3		7	
Thermal Resistance.Junction- to-Ambient	$t \leq 10sec$ *2&4	R_{thJA}	15	$^\circ C/W$
Thermal Resistance.Junction- to-Case	Steady State	R_{thJC}	1.8	
Junction Temperature		T_J	175	$^\circ C$
Storage Temperature Range		T_{stg}	-55 to 175	

*1: Based on $T_C = 25^\circ C$.

*2: Surface mounted on 1" x 1" FR4 board.

*3: $t = 10 sec$

*4: Maximum under steady state conditions is $50^\circ C/W$.

*5: Calculated based on maximum junction temperature. Package limitation current is 50 A.

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■ 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	30			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =30V, V _{GS} =0V			1	μA
		V _{DS} =30V, V _{GS} =0V, T _J =55°C			10	
Gate-Body Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250 μA	1.2		2.4	V
Static Drain-Source On-Resistance *1	R _{DS(on)}	V _{GS} =10V, I _D =20A		4.6	5.7	mΩ
		V _{GS} =4.5V, I _D =20A		6.2	7.8	
On State Drain Current *1	I _{D(on)}	V _{GS} =10V, V _{DS} =5V	50			A
Forward Transconductance *1	g _{FS}	V _{DS} =15V, I _D =30A		70		S
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =15V, f=1MHz *2		3800		pF
Output Capacitance	C _{oss}			615		
Reverse Transfer Capacitance	C _{rss}			305		
Gate Resistance	R _g	V _{GS} =0V, V _{DS} =0V, f=1MHz		0.9	1.4	Ω
Total Gate Charge	Q _g	V _{GS} =10V, V _{DS} =15V, I _D =30A *2		62	95	nC
		V _{GS} =4.5V, V _{DS} =15V, I _D =25A *2		30	45	
Gate Source Charge	Q _{gs}	V _{GS} =4.5V, V _{DS} =15V, I _D =25A *2		11		
Gate Drain Charge	Q _{gd}			9		
Turn-On DelayTime	t _{d(on)}	V _{GS} =10V, V _{DS} =15V, R _L =0.5 Ω, R _{GEN} =1 Ω, I _D =30A *2		12	18	ns
Turn-On Rise Time	t _r			10	15	
Turn-Off DelayTime	t _{d(off)}			30	45	
Turn-Off Fall Time	t _f			8	12	
Turn-On DelayTime	t _{d(on)}	V _{GS} =4.5V, V _{DS} =15V, R _L =0.6 Ω, R _{GEN} =1 Ω, I _D =25A *2		26	40	
Turn-On Rise Time	t _r			230	345	
Turn-Off DelayTime	t _{d(off)}			25	40	
Turn-Off Fall Time	t _f			9	14	
Body Diode Reverse Recovery Time	t _{rr}	I _F =6.7A, di/dt=100A/μs, T _J =25°C		65	100	nC
Body Diode Reverse Recovery Charge	Q _{rr}			38	60	
Reverse Recovery Fall Time	t _a			50		ns
Reverse Recovery Rise Time	t _b			15		
Maximum Body-Diode Continuous Current	I _S	T _C =25°C *3			55	A
Pulse Diode Forward Current *1	I _{SM}				100	
Diode Forward Voltage	V _{SD}	I _S =6.7A, V _{GS} =0V		0.9	1.5	V

*1: Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.

*2: Guaranteed by design, not subject to production testing.

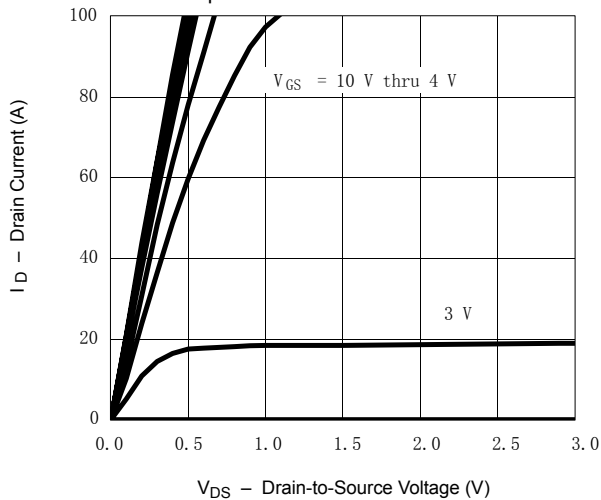
*3: Calculated based on maximum junction temperature. Package limitation current is 50 A.

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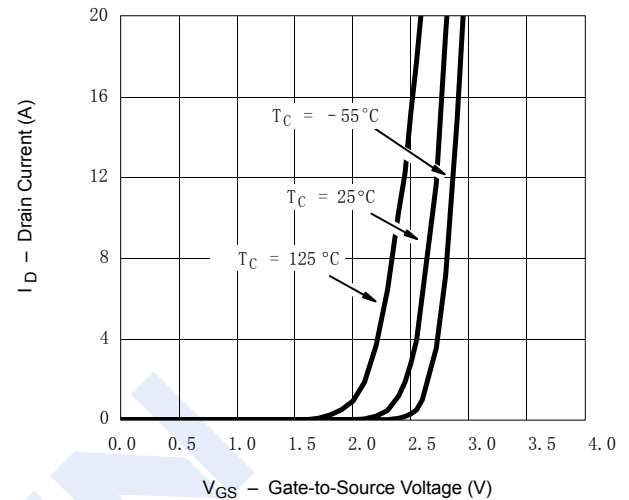
NDT50N03

■ Typical Characteristics

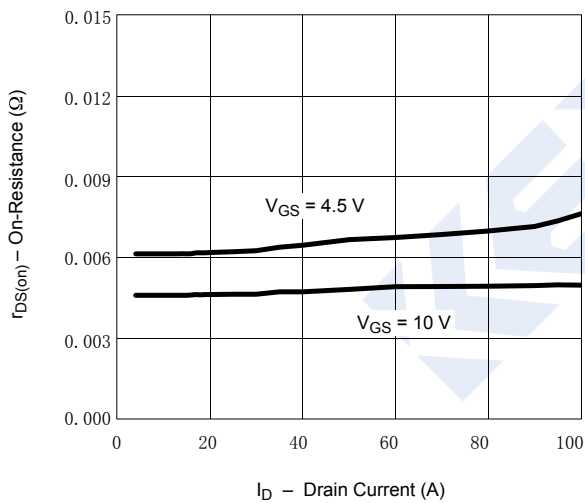
Output Characteristics



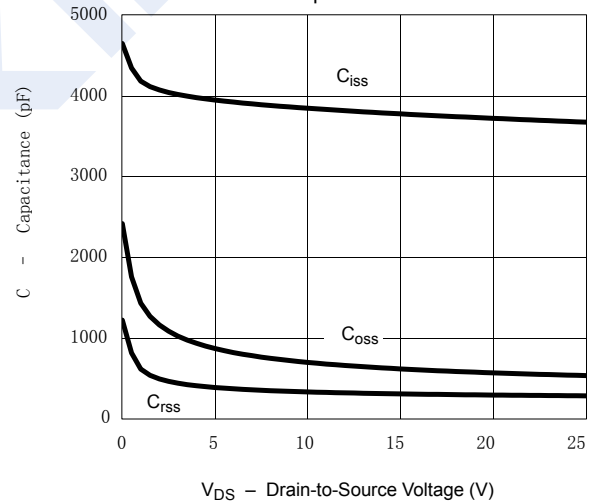
Transfer Characteristics



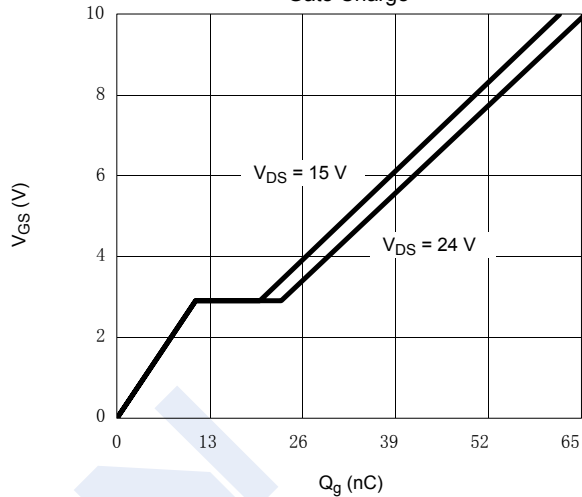
On-Resistance vs. Drain Current



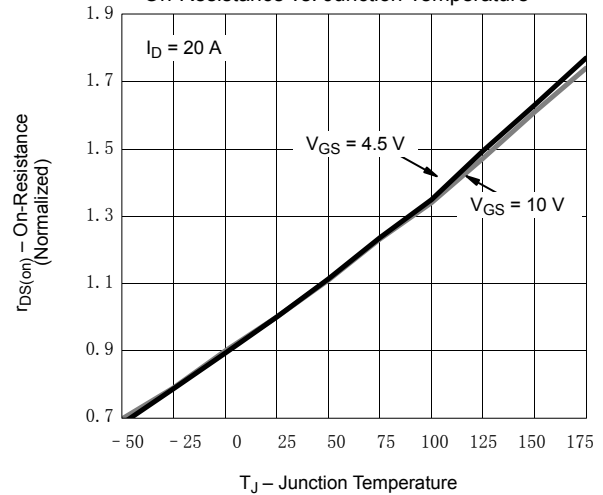
Capacitance



Gate Charge



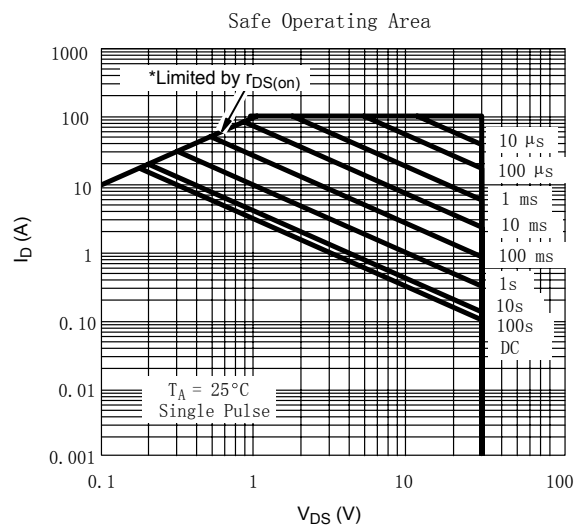
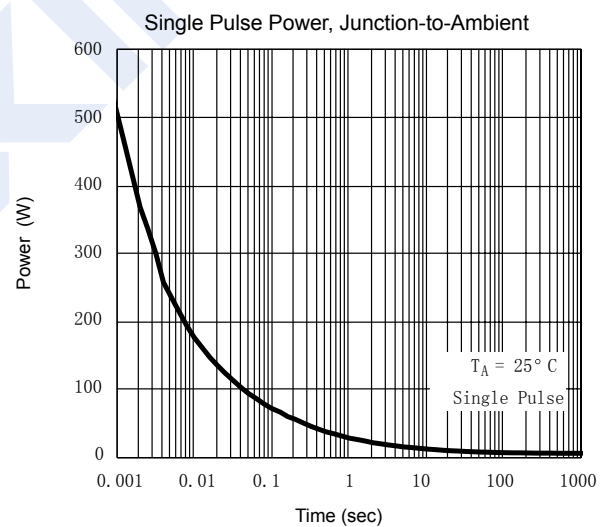
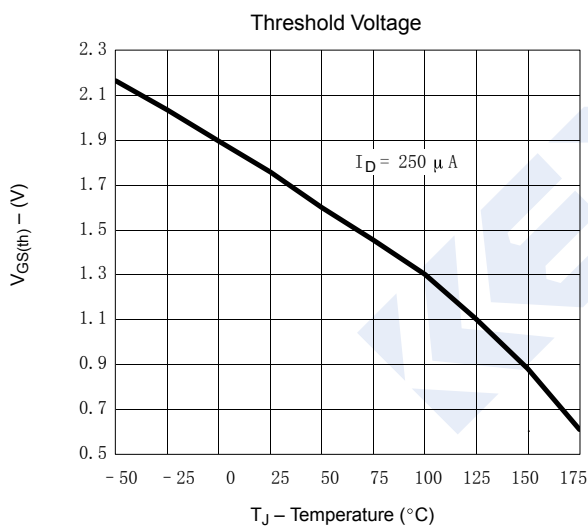
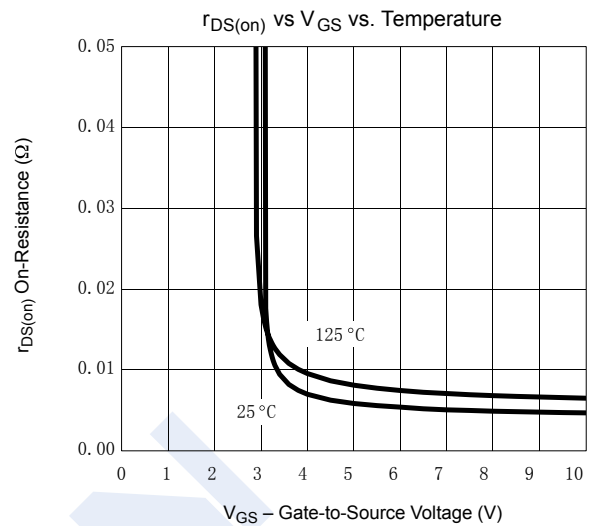
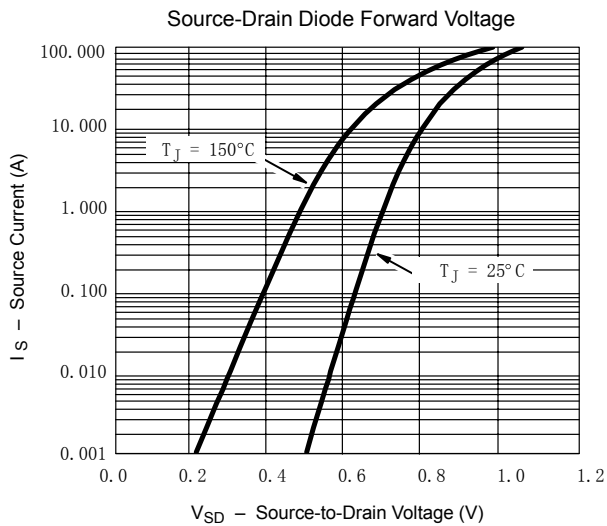
On-Resistance vs. Junction Temperature



N-Channel MOSFET

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■ Typical Characteristics



* $V_{GS} >$ minimum V_{GS} at which $r_{DS(on)}$ is specified

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■ Typical Characteristics

