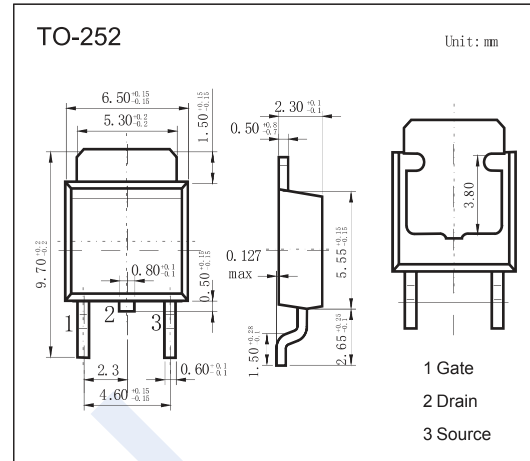
N-Channel MOSFET
NDT4N60



■ Features

- V_{DS} (V) = 600V
- I_D = 3.9 A (V_{GS} = 10V)
- $R_{DS(ON)}$ < 1.2Ω (V_{GS} = 10V)
- Low effective output capacitance

■ Absolute Maximum Ratings Ta = 25℃

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	600	V
Gate-Source Voltage		V_{GS}	±30	V
Continuous Drain Current	Tc=25℃	I_D	3.9	A
	Tc=70℃		2.5	
Pulsed Drain Current		I_{DM}	11.7	A
Avalanche Current		I_{AR}	3.9	A
Single Pulsed Avalanche Energy (Note.1)		E_{AS}	128	mJ
Repetitive Avalanche Energy		E_{AR}	5	mJ
Peak Diode Recovery dv/dt		dv/dt	4.5	V/ns
Power Dissipation	Tc=25℃	P_D	50	W
	- Derate above 25°C		0.4	W/℃
Thermal Resistance.Junction- to-Ambient		R_{thJA}	83	℃/W
Thermal Resistance.Junction- to-Case		R_{thJC}	2.5	℃/W
Maximum Lead Temperature for Soldering Purpose		T_L	300	℃
Junction Temperature		T_J	150	℃
Storage Temperature Range		Tstg	-55 to 150	℃

Note.1: I_{AS} = 1.9A, V_{DD} = 50V, R_G = 25Ω, Starting T_J = 25°C

N-Channel MOSFET
NDT4N60

■ Electrical Characteristics Ta = 25℃

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{DSS}	I_D=250μA, V_{GS}=0V，T_J=25℃	600			V
		I_D=250μA, V_{GS}=0V，T_J=150℃		650		
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=600V, V_{GS}=0V			1	uA
		V_{DS}=480V, V_{GS}=0V, T_C=125℃			10	
Gate-Body Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±30V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS} , I_D=250μA	3		5	V
Static Drain-Source On-Resistance	$R_{DS(On)}$	V_{GS}=10V, I_D=2 A		1	1.2	Ω
Forward Transconductance	g_{FS}	V_{DS}=40V, I_D=2 A		3.2		S
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=25V, f=1MHz		415	540	pF
Output Capacitance	C_{oss}			210	275	
Reverse Transfer Capacitance	C_{rss}			19.5		
Output Capacitance	C_{oss}	V_{DS} = 480V, V_{GS} = 0V, f = 1MHz		12	16	
Effective Output Capacitance	$C_{oss.eff}$	V_{DS} = 0V to 400V, V_{GS} = 0V		32		
Total Gate Charge	Q_g	V_{GS}=10V, V_{DS}=480V, I_D=3.9A		12.8	16.6	nC
Gate Source Charge	Q_{gs}			2.4		
Gate Drain Charge	Q_{gd}			7.1		
Turn-On DelayTime	$t_{d(on)}$	V_{DS}=300V, I_D=3.9A,R_G=25Ω (Note.1)		16	45	ns
Turn-On Rise Time	t_r			45	100	
Turn-Off DelayTime	$t_{d(off)}$			36	85	
Turn-Off Fall Time	t_f			30	70	
Body Diode Reverse Recovery Time	t_{rr}	I_F= 3.9A, d_I/d_t= 100A/μs,V_{GS}=0 (Note.1)		277		
Body Diode Reverse Recovery Charge	Q_{rr}			2.07		nC
Maximum Body-Diode Continuous Current	I_S				3.9	A
Pulsed Drain-Source Diode Forward Current	I_{SM}				11.7	
Diode Forward Voltage	V_{SD}	I_S=3.9A,V_{GS}=0V			1.4	V

Note.1:Pulse Test: Pulse width ≤ 300μs, Duty Cycle ≤ 2%

N-Channel MOSFET
NDT4N60

■ Typical Characterisitics

Figure 1. On-Region Characteristics

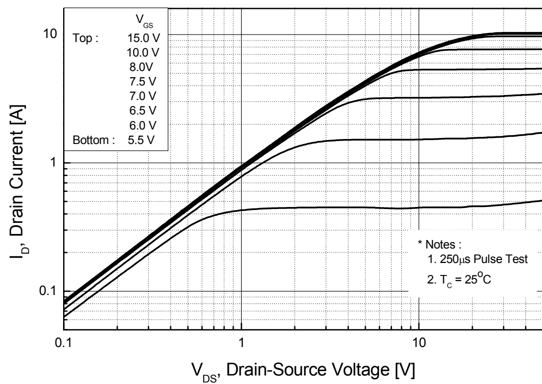


Figure 2. Transfer Characteristics

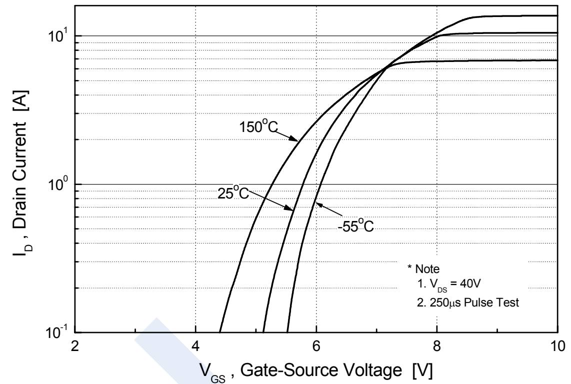


Figure 3. On-Resistance Variation vs. Drain Current and Gate Voltage

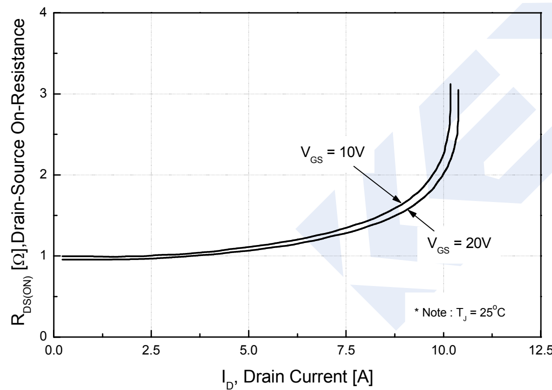


Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperatue

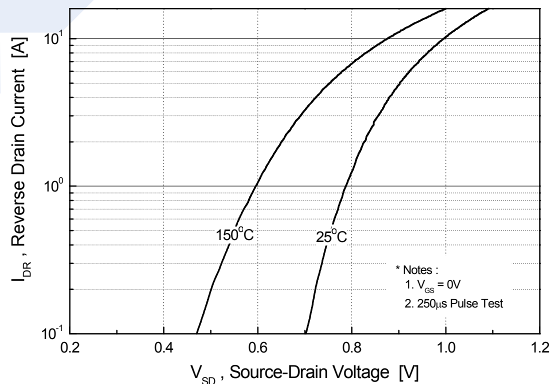


Figure 5. Capacitance Characteristics

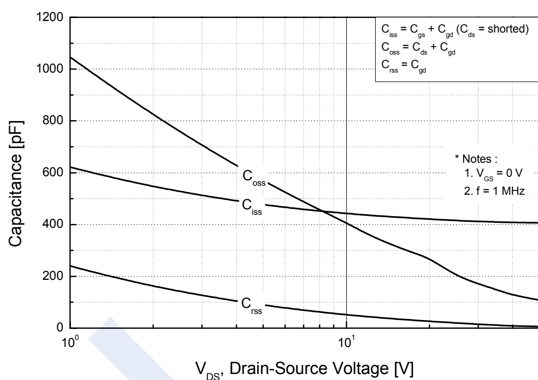
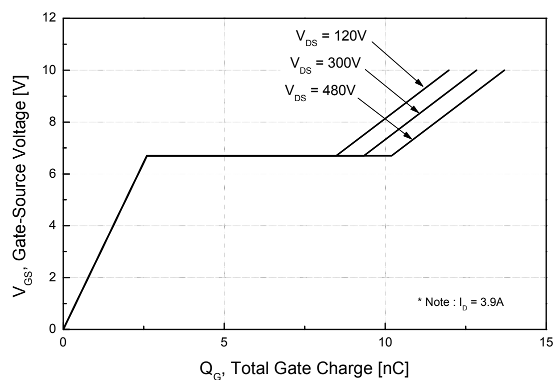


Figure 6. Gate Charge Characteristics



N-Channel MOSFET
NDT4N60

■ Typical Characterisitics

Figure 7. Breakdown Voltage Variation vs. Temperature

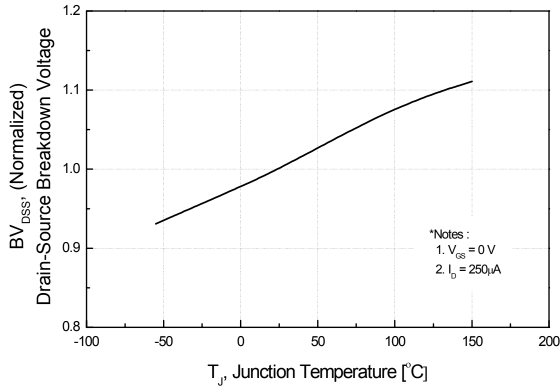


Figure 8. On-Resistance Variation vs. Temperature

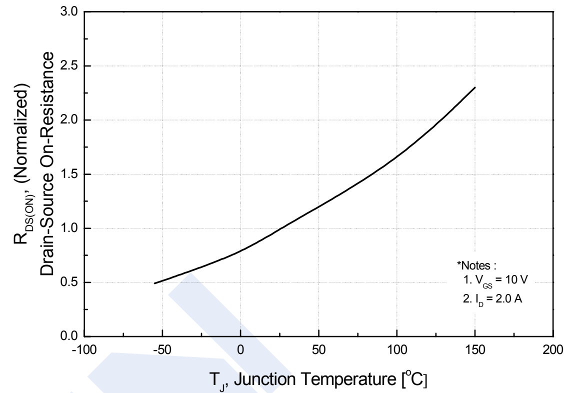


Figure 9. Maximum Safe Operating Area

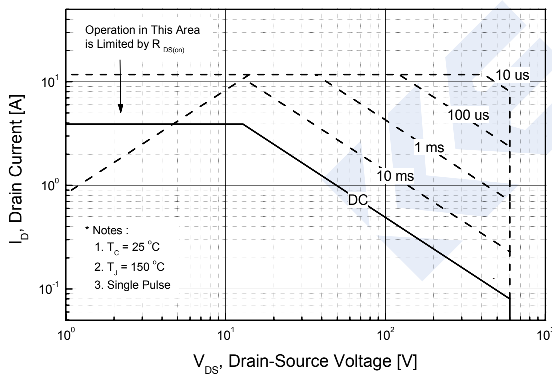


Figure 10. Maximum Drain Current vs. Case Temperature

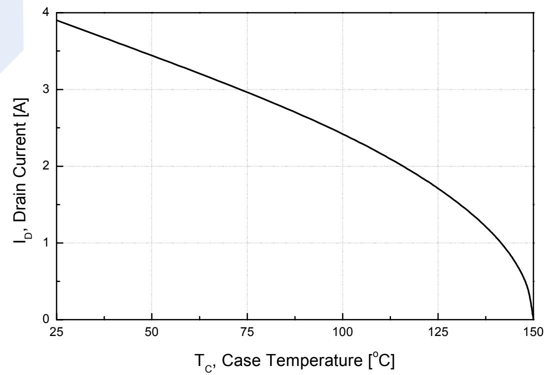


Figure 11-1. Transient Thermal Response Curve