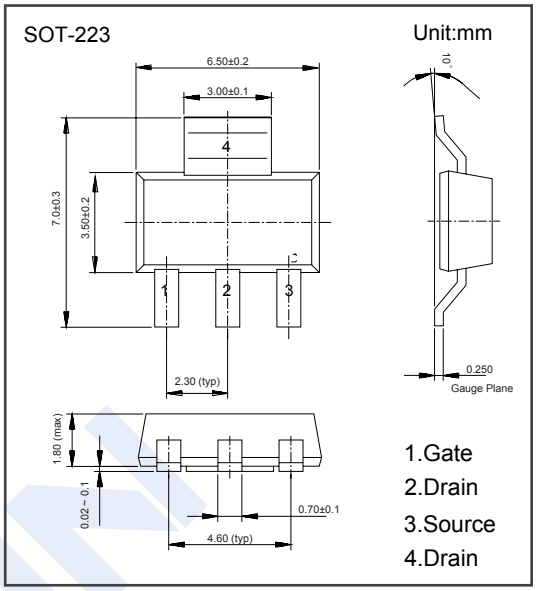
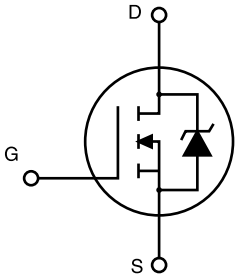
N-Channel MOSFET
NDT4N20L



■ Features

- $V_{DS\ (V)}$ = 200V
- I_D = 1 A (V_{GS} = 10V)
- $R_{DS(ON)}$ < 1.5Ω (V_{GS} = 10V)
- $R_{DS(ON)}$ < 1.55Ω (V_{GS} = 5V)
- Low gate charge



■ Absolute Maximum Ratings Ta = 25℃

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	200	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current	Tc=25℃	I_D	1	A
	Tc=70℃		0.63	
Pulsed Drain Current		I_{DM}	4	
Avalanche Current, Repetetive Or Not Repetetive		I_{AR}	1	
Power Dissipation	Tc=25℃	P_D	3.3	W
Single Pulse Avalanche Energy (Note.1)		E_{AS}	90	mJ
Peak Diode Recovery Voltage Slope (Note.2)		dv/dt	20	V/ns
Thermal Resistance.Junction- to-Ambient (Note.3)		R_{thJA}	62.5	℃/W
Thermal Resistance.Junction- to-Case (Note.4)		R_{thJC}	38	
Junction Temperature		T_J	150	℃
Storage Temperature Range		T_{stg}	-55 to 150	

Note.1:Starting Tj = 25 °C, I_D = I_{AR}, V_{DD} = 50 V.

Note.2: Isd ≤ 1 A, di/dt ≤ 200 A/μs, V_{DD} ≤ 80% $V_{(BR)DSS}$.

Note.3: When mounted on 1 inch² FR-4 board, 2 oz. Cu, (t > 10 sec).

Note.4: When mounted on 1 inch² FR-4 board, 2 oz. Cu, (t < 10 sec).

N-Channel MOSFET
NDT4N20L

■ Electrical Characteristics Ta = 25℃

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{DSS}	I_D=250μA, V_{GS}=0V	200			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=Max rating, V_{GS}=0V			1	uA
		V_{DS}=Max rating, V_{GS}=0V, T_J=125℃			50	
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=250μA	1		3	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=0.5A			1.5	Ω
		V_{GS}=5V, I_D=0.5A			1.55	
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=25V, f=1MHz		150		pF
Output Capacitance	C_{oss}			30		
Reverse Transfer Capacitance	C_{rss}			4		
Gate Resistance	R_g	V_{GS}=0V, V_{DS}=0V, f=1MHz		5.5		Ω
Total Gate Charge	Q_g	V_{GS}=10V, V_{DS}=160V, I_D=1A		0.9		nC
Gate Source Charge	Q_{gs}			2.6		
Gate Drain Charge	Q_{gd}			6.9		
Turn-On DelayTime	$t_{d(on)}$	V_{GS}=10V, V_{DS}=100V, I_D=0.5A, R_G=4.7Ω		3.6		ns
Turn-On Rise Time	t_r			2		
Turn-Off DelayTime	$t_{d(off)}$			10.4		
Turn-Off Fall Time	t_f			15.4		
Reverse Recovery Time	t_{rr}	I_F= 1A, di/dt= 100A/μs,V_{DD}=60V		51		
Reverse Recovery Charge	Q_{rr}			90		nC
Reverse Recovery Current	I_{RRM}			3.5		A
Reverse Recovery Time	t_{rr}	I_F= 1A, di/dt= 100A/us,V_{DD}=60V, T_J=150℃		56		ns
Reverse Recovery Charge	Q_{rr}			105		nC
Reverse Recovery Current	I_{RRM}			3.7		A
Source-Drain Current	I_S	(Note.1)			1	
Source-Drain Current-Plused	I_{SM}	(Note.1)			4	
Diode Forward Voltage	V_{SD}	I_S=1A,V_{GS}=0V (Note.1)			1.6	V

Note.1: Pulsed: pulse duration = 300 μs, duty cycle 1.5%

■ Marking

Marking	4N20L

N-Channel MOSFET
NDT4N20L

■ Typical Characterisitics

Figure 1. Safe operating area

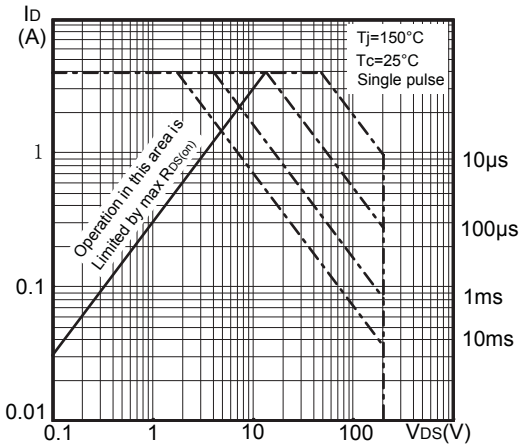


Figure 2. Thermal impedance

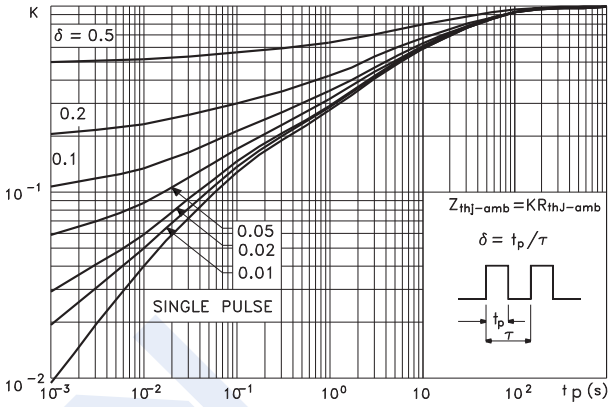


Figure 3. Output characteristics

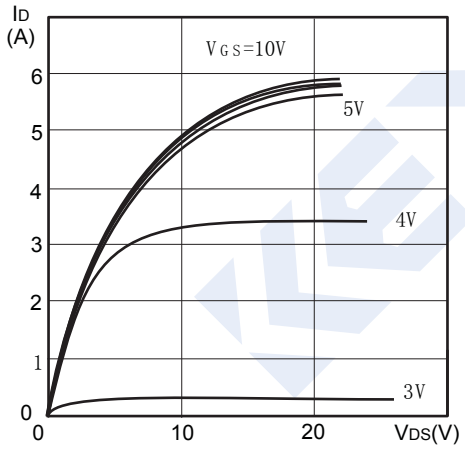


Figure 4. Transfer characteristics

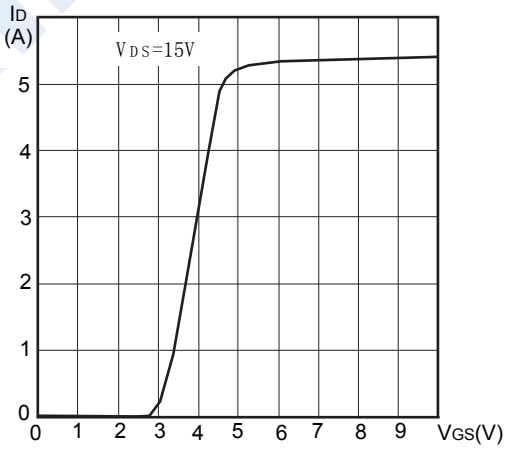


Figure 5. Normalized B $_{VDSS}$ vs temperature

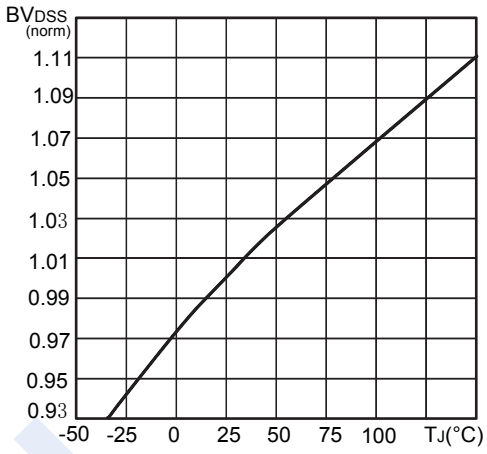
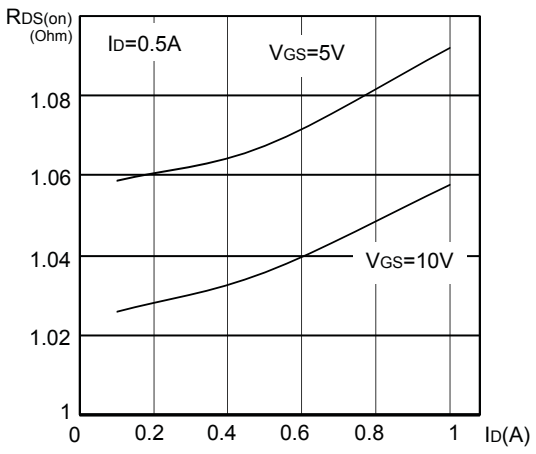


Figure 6. Static drain-source on resistance



N-Channel MOSFET
NDT4N20L

■ Typical Characterisitics

Figure 7. Gate charge vs gate-source voltage

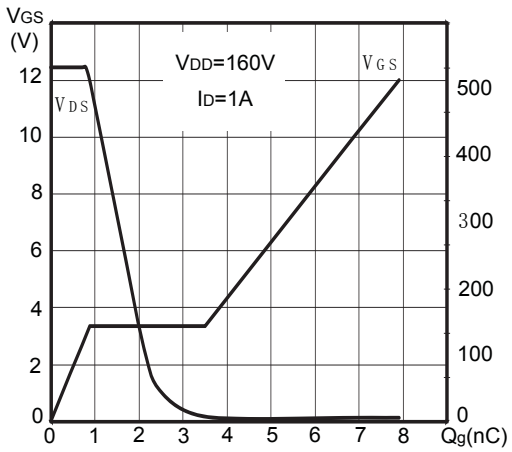


Figure 8. Capacitance variations

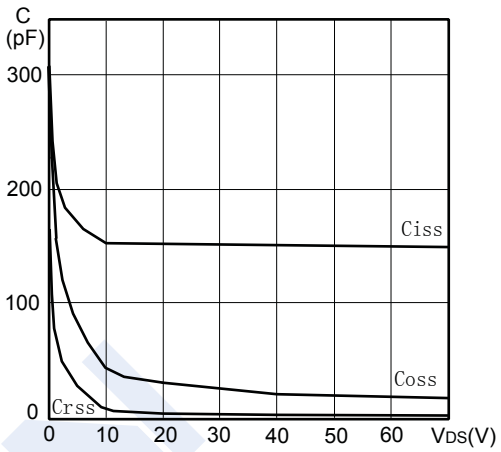


Figure 9. Normalized gate threshold voltage vs temperature

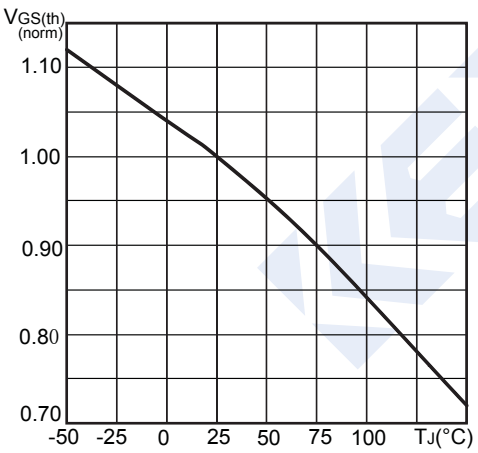


Figure 10. Normalized on resistance vs temperature

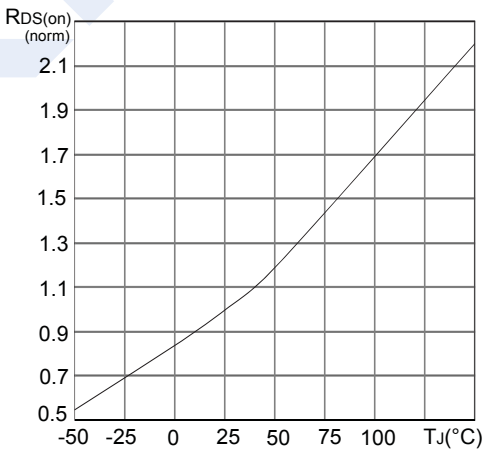


Figure 11. Switching times test circuit for resistive load

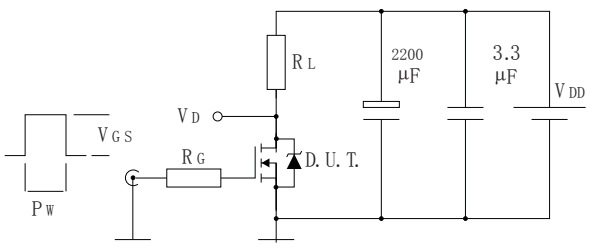
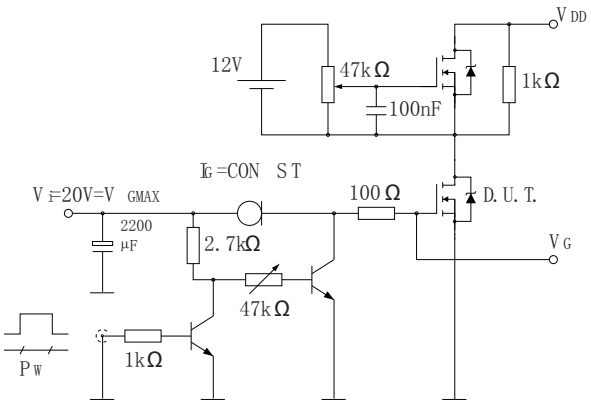


Figure 12. Gate charge test circuit



N-Channel MOSFET
NDT4N20L

■ Typical Characterisitics

Figure 13. Test circuit for inductive load switching and diode recovery times

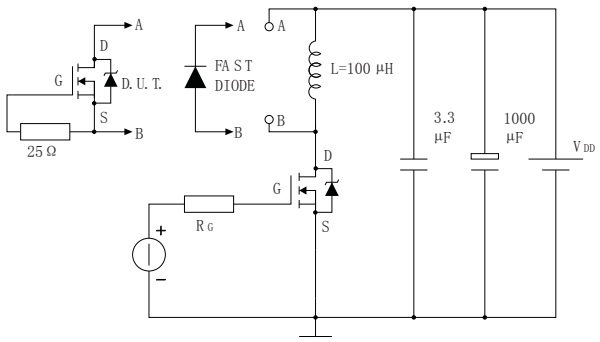


Figure 14. Unclamped inductive load test circuit

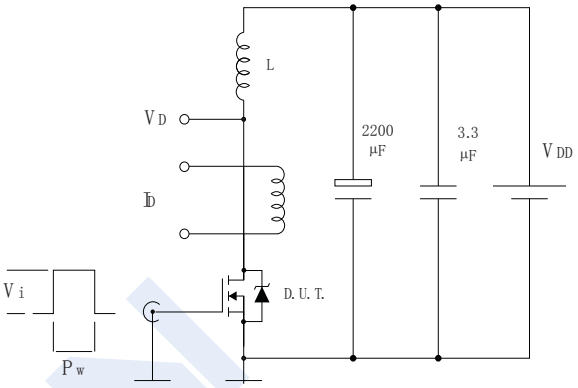


Figure 15. Unclamped inductive wavefor m

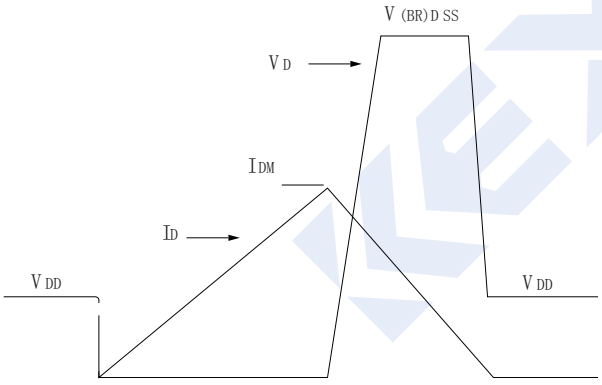


Figure 16. Switching time waveform