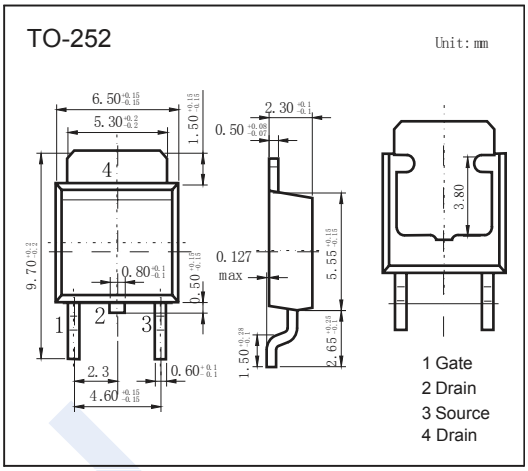
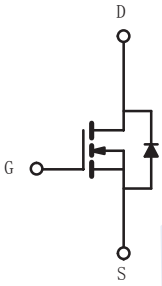
N-Channel MOSFET

NDT8N20



■ Features

- V_{DS} =200V,I_D =8A
- $R_{DS(ON)}$ <300mΩ @ VGS=10V（Typ：260mΩ）
- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Low gate to drain charge to reduce switching losses



■ Absolute Maximum Ratings (T_C = 25℃, unless otherwise specified)

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	200	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current	T_C = 25℃	I_D	8	A
	T_C = 100℃		5.6	
Pulsed Drain Current		I_{DM}	20	
Power Dissipation		P_D	55	W
Thermal Resistance.Junction- to-Case (Note 2)		R_{thJC}	2.3	℃/W
Junction Temperature		T_J	150	℃
Storage Temperature Range		T_{stg}	-55 to 150	

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■ Electrical Characteristics (T_C = 25℃, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	V_{DSS}	I_D=250μA, V_{GS}=0V	200			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=200V, V_{GS}=0V			1	μA
Gate-Body Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V			±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS} , I_D=250μA	1		2.5	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D = 4.5A			300	mΩ
Forward Transconductance	g_{fs}	V_{GS}=25V, I_D = 4.5A	3			S
Dynamic Characteristics (Note4)						
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=25V, f=1MHz		540		pF
Output Capacitance	C_{oss}			90		
Reverse Transfer Capacitance	C_{rss}			35		
Switching Characteristics (Note 4)						
Turn-On DelayTime	$t_{d(on)}$	V_{DD}=100V, I_D = 4.5A, V_{GS} = 10V, R_{GEN} = 5Ω		6.4	25	ns
Turn-On Rise Time	t_r			11	70	
Turn-Off DelayTime	$t_{d(off)}$			20	80	
Turn-Off Fall Time	t_f			12	68	
Total Gate Charge	Q_g	V_{DS}=160V, I_D=4.5A, V_{GS}=10V		16	30	nC
Gate Source Charge	Q_{gs}			3.4	15	
Gate Drain Charge	Q_{gd}			5.1	21	
Drain-Source Diode Characteristics						
Diode Forward Current (Note 2)	I_S				8	A
Diode Forward Voltage (Note 3)	V_{SD}	I_F=8A,V_{GS}=0V			1.2	V

Notes: 1. Repetitive Rating: Pulse width limited by maximum junction temperature.

2. Surface Mounted on FR4 Board, t ⩽ 10 sec.

3. Pulse Test: Pulse Width ⩽ 300μs, Duty Cycle ⩽ 2%.

4. Guaranteed by design, not subject to production

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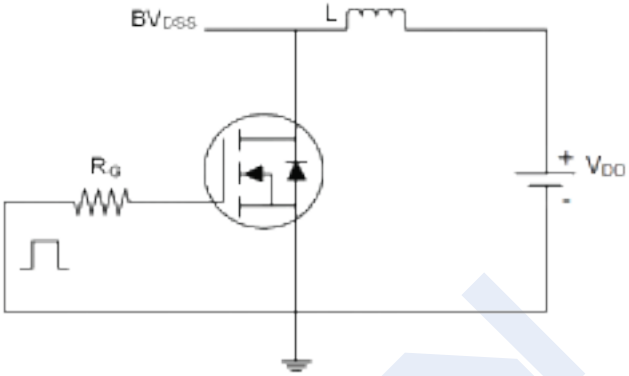
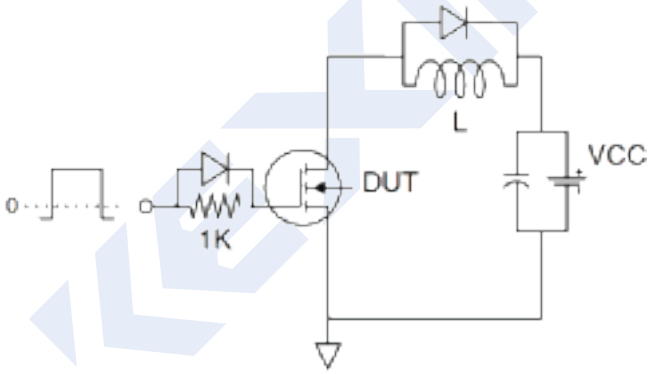
■ Test Circuit

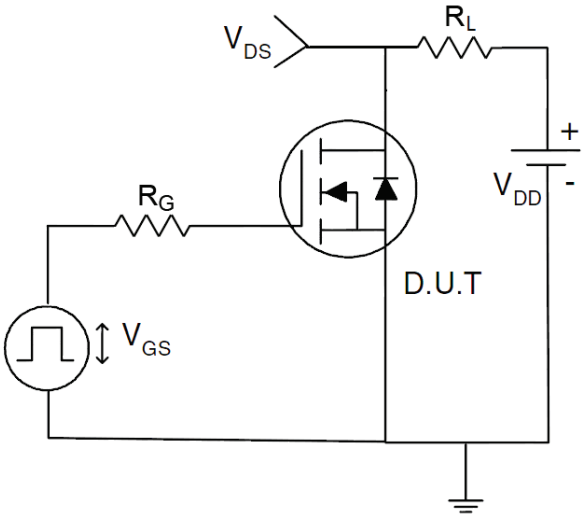
1）E_{AS} test Circuit



2）Gate charge test Circuit



3）Switch Time Test Circuit



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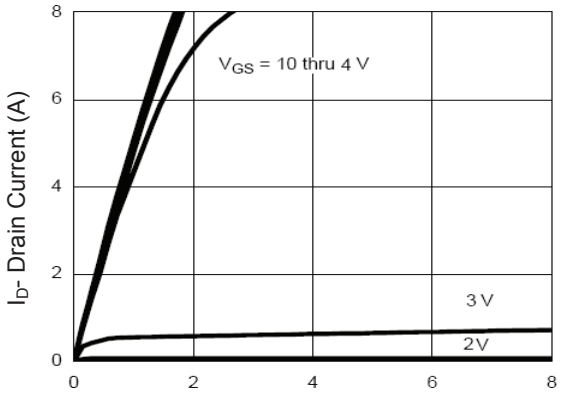
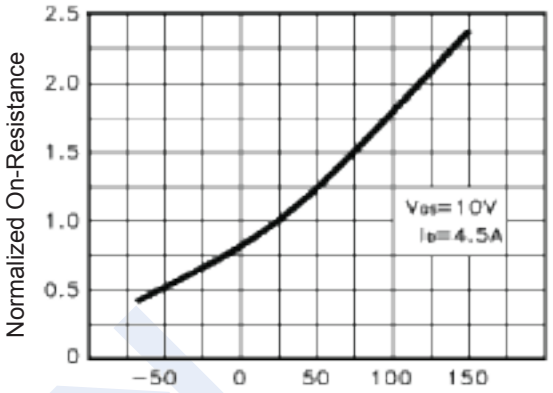
■ Typical Characterisitics



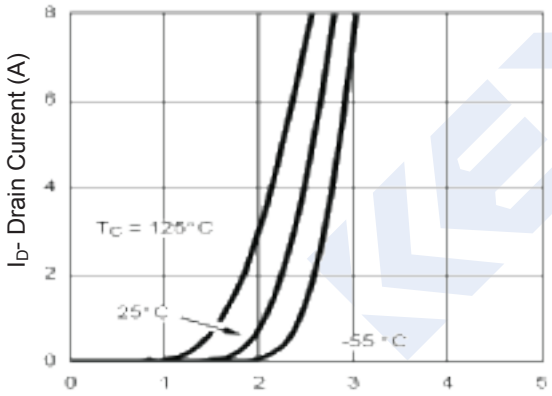
Vds Drain-Source Voltage (V)

Figure 1 Output Characteristics



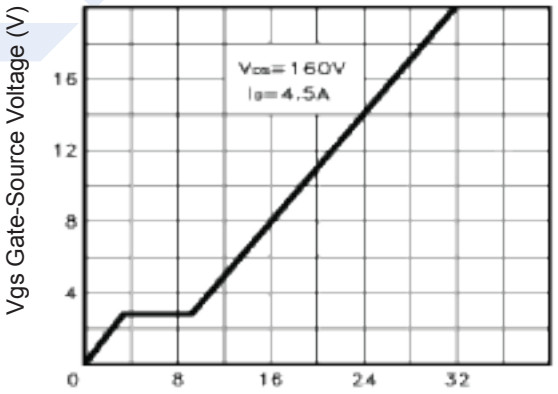
TJ-Junction Temperature(℃)

Figure 4 Rdson-JunctionTemperature



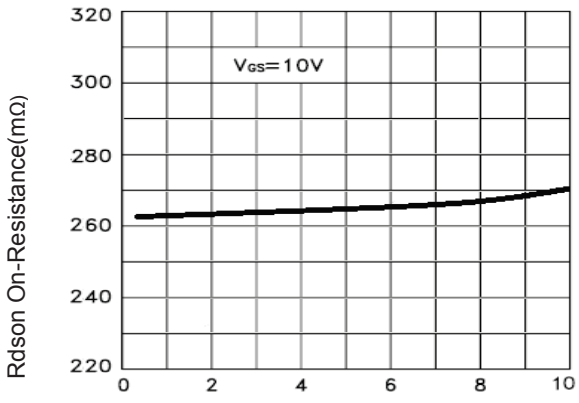
Vgs Gate-Source Voltage (V)

Figure 2 Transfer Characteristics



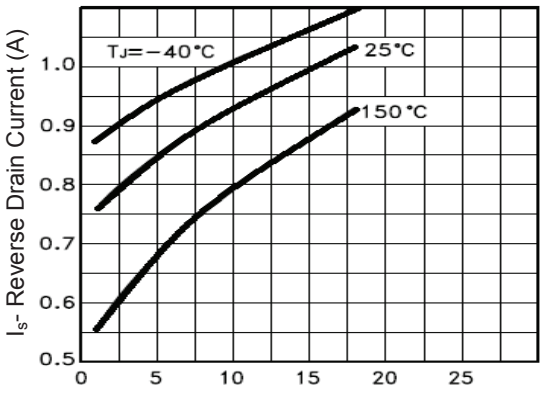
Qg Gate Charge (nC)

Figure 5 Gate Charge



ID- Drain Current (A)

Figure 3 Rdson- Drain Current



Vsd Source-Drain Voltage (V)

Figure 6 Source- Drain Diode Forward

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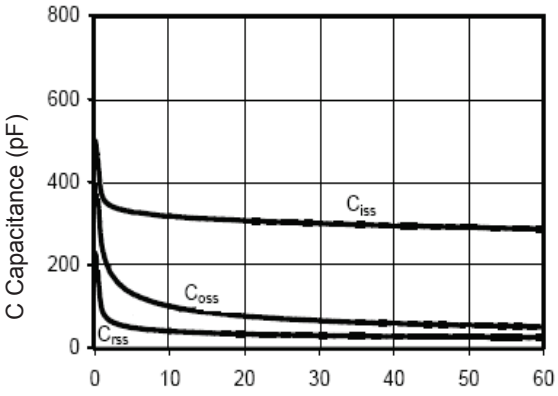

Figure 7 Capacitance vs Vds

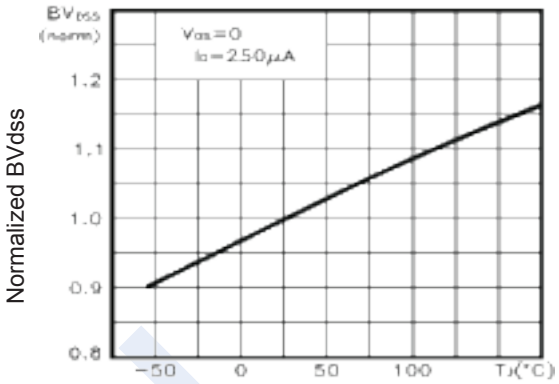

Figure 9 BV_{DSS} vs Junction Temperature

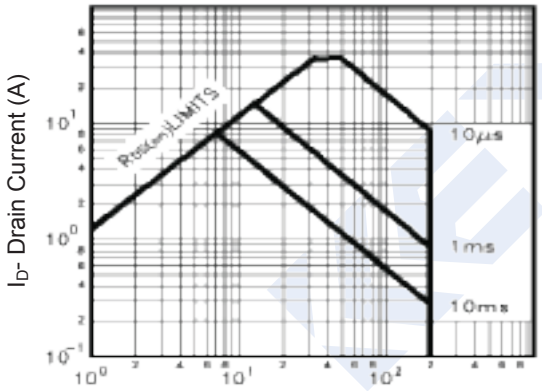

Figure 8 Safe Operation Area

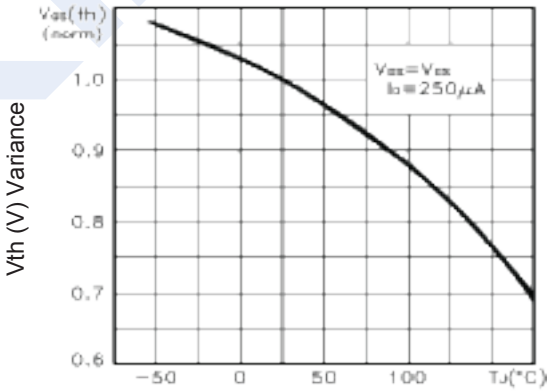

Figure 10 $V_{GS(th)}$ vs Junction Temperature

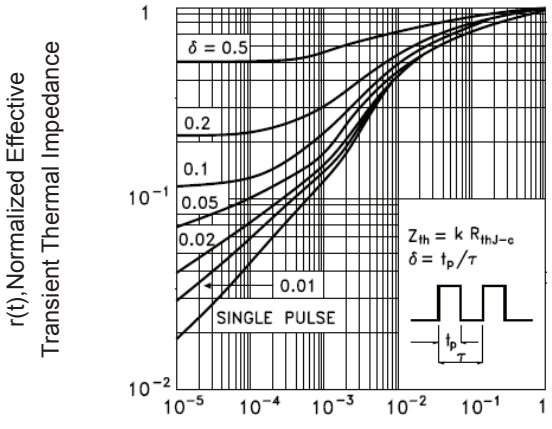

Figure 11 Normalized Maximum Transient Thermal Impedance