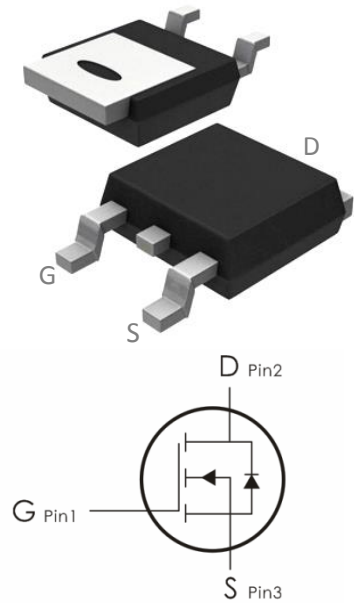# STD7NS20

Description：

This N-Channel MOSFET uses advanced trench technology and

design to provide excellent $R_{DS(on)}$ with low gate charge.

It can be used in a wide variety of applications.

Features：

1) V_{DS}=200V,I_D=9A,$R_{DS(ON)}$≤0.4 Ω @V_{GS}=10V

2) Low gate charge.

3) Green device available.

4) Advanced high cell denity trench technology for ultra $R_{DS(ON)}$.

5) Excellent package for good heat dissipation.

Absolute Maximum Ratings： (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	200	V
V_{GS}	Gate-Source Voltage	±30	V
I_D	Continuous Drain Current-TC=25℃	9	A
	Continuous Drain Current-TC=100℃	5.7	
	Pulsed Drain Current	---	
E_{AS}	Single Pulse Avalanche Energy[1]	160	mJ
P_D	Power Dissipation(T_C=25℃)	38	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	℃

Thermal Characteristics：

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance,Junction to Case	2.27	℃/W
$R_{\theta JA}$	Thermal Resistance,Junction to Ambient	110	

Electrical Characteristics： (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Sourtce Breakdown Voltage	V_{GS}=0V,I_D=250 μA	200	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{GS}=0V, V_{DS}=200V	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±30V, V_{DS}=0A	---	---	±100	nA
On Characteristics						
$V_{GS(th)}$	GATE-Source Threshold Voltage	V_{GS}=V_{DS}, I_D=250 μA	2	---	4	V
$R_{DS(ON)}$	Drain-Source On Resistance	V_{GS}=10V,I_D=5A	---	---	0.4	Ω
Dynamic Characteristics						
C_{iss}	Input Capacitance		---	550	720	
C_{oss}	Output Capacitance	V_{DS}=25V, V_{GS}=0V, f=1MHz	---	85	110	pF
C_{rss}	Reverse Transfer Capacitance		---	22	29	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time[3,4]		---	11	25	ns
t_r	Rise Time[3,4]	V_{DD}=250V, I_D=9A,	---	70	140	ns
$t_{d(off)}$	Turn-Off Delay Time[3,4]	R_{GEN}=25 Ω	---	60	120	ns
t_f	Fall Time[3,4]		---	65	130	ns
Q_g	Total Gate Charge[3,4]		---	22	30	nC
Q_{gs}	Gate-Source Charge[3,4]	V_{GS}=10V, V_{DS}=400V,	---	4.0	---	nC
Q_{gd}	Gate-Drain "Miller" Charge[3,4]	I_D=9A	---	11	---	nC
Drain-Source Diode Characteristics						
V_{SD}	Source-Drain Diode Forward Voltage	V_{GS}=0V,I_D=9A	---	---	1.5	V

Notes:

1, L=3.0mH, IAS=9A, VDD=50V, RG=25Ω, Starting TJ =25°C

2, Repetitive Rating : Pulse width limited by maximum junction temperature

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

4, Essentially Independent of Operating Temperature.

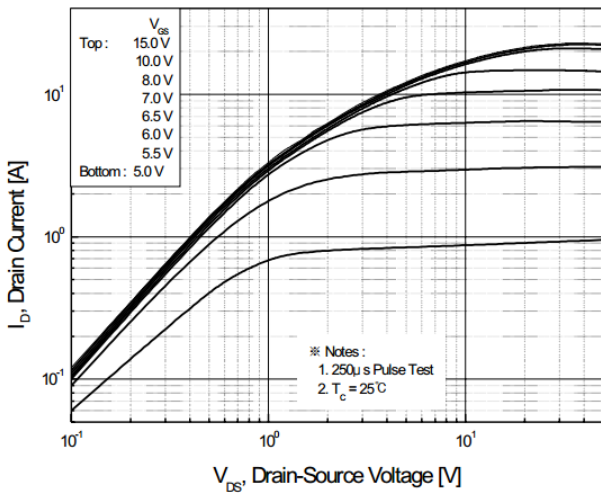## Typical Characteristics： $(T_C=25°C$ unless otherwise noted)
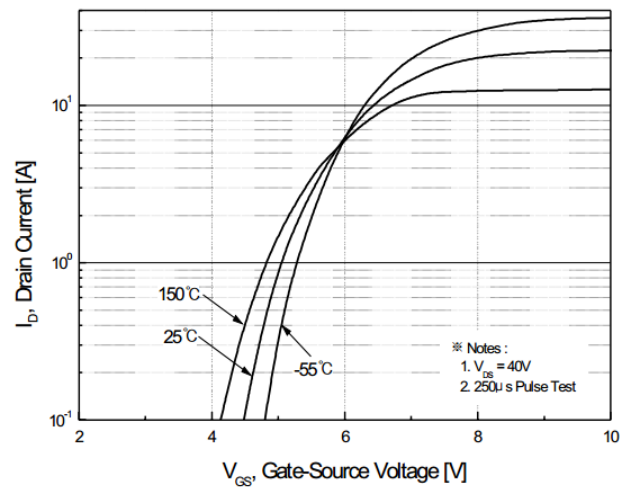

Figure 1. On-Region Characteristics
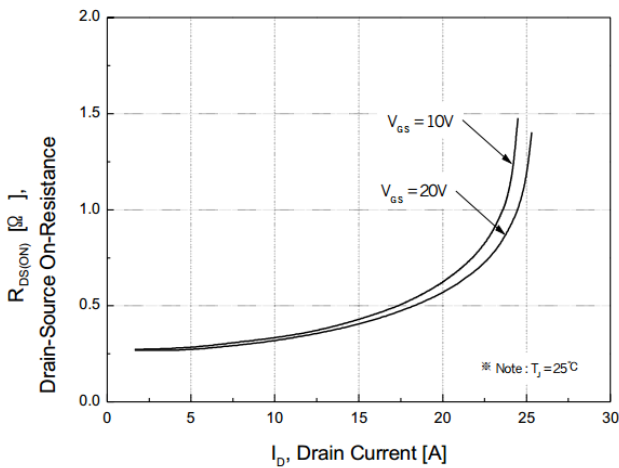

Figure 2. Transfer Characteristics

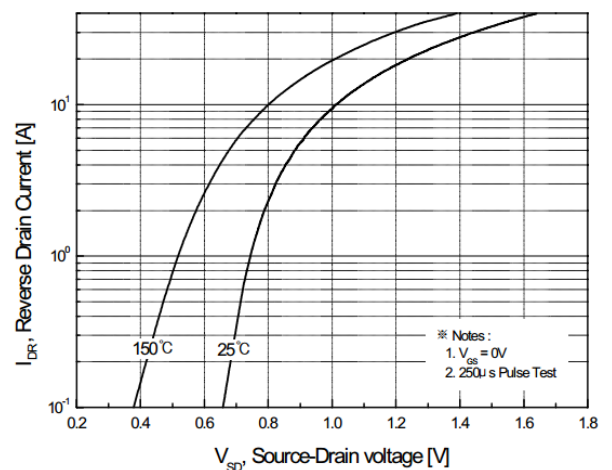Figure 3. On-Resistance Variation vs.
Drain Current and Gate Voltage

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

![DOINGTER logo]

Figure 5. Capacitance Characteristics

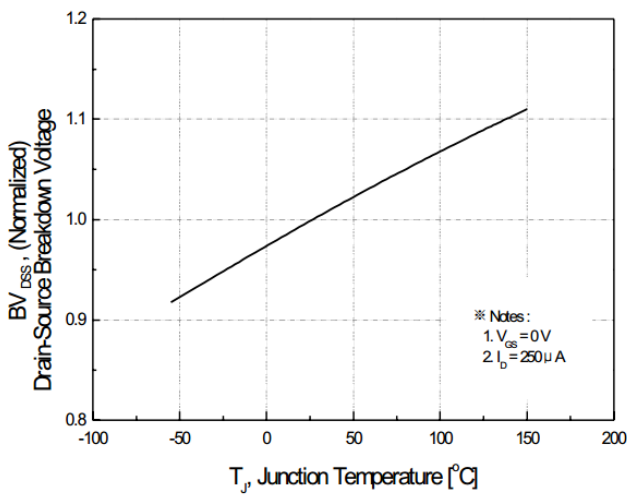Figure 6. Gate Charge Characteristics

Figure 7. Breakdown Voltage Variation
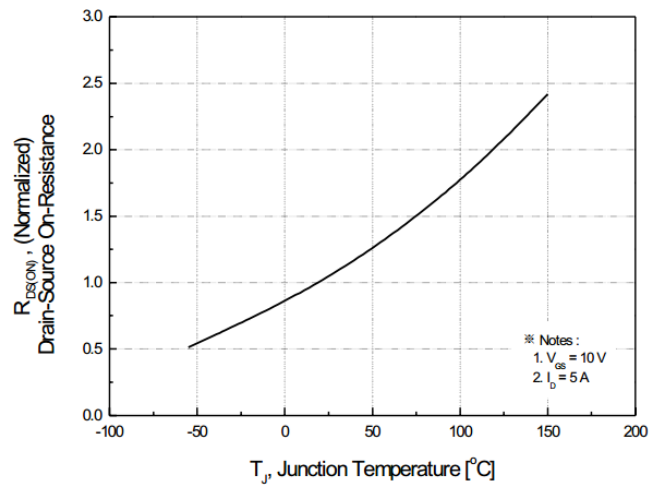vs. Temperature
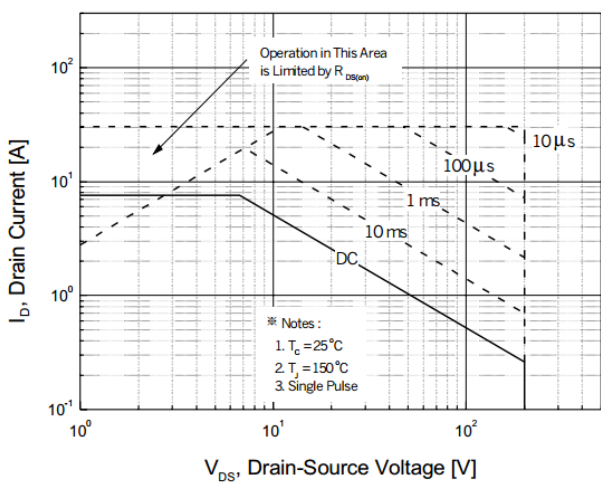

Figure 8. On-Resistance Variation
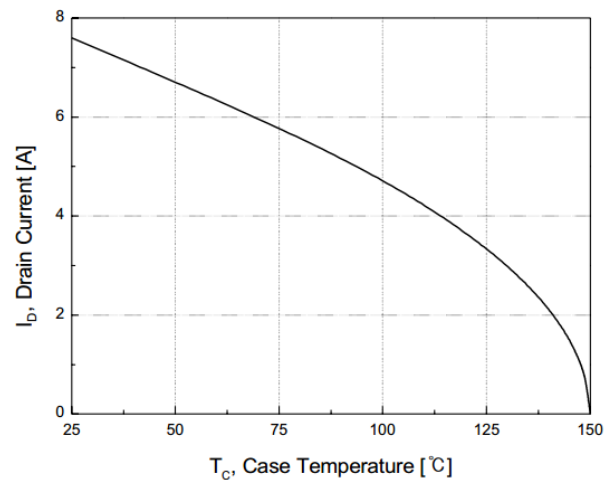vs. Temperature

Figure 9. Maximum Safe Operating Area
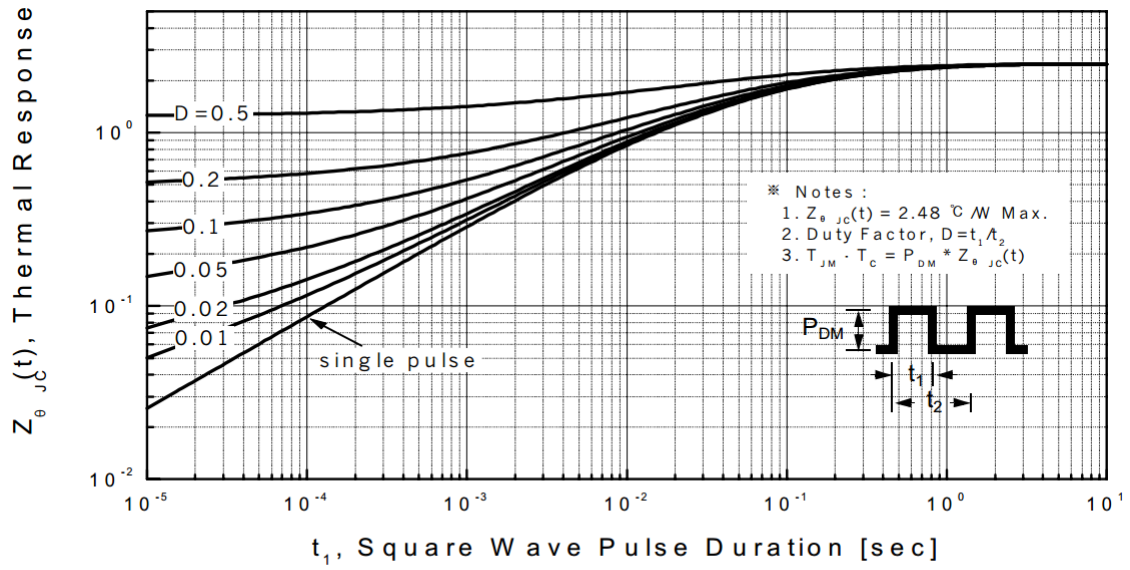

Figure 10. Maximum Drain Current
vs. Case Temperature

Figure 11. Transient Thermal Response Curve

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