

Description:

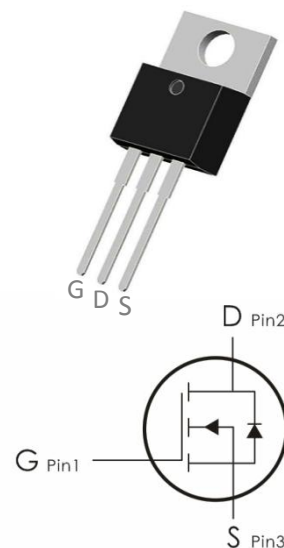
This N-Channel MOSFET uses advanced Planar technology and

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

It can be used in a wide variety of applications.

Features:

- 1) $V_{DS}=200V, I_D=9A, R_{DS(on)} < 0.3 \Omega @ V_{GS}=10V$
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density trench technology for ultra low $R_{DS(on)}$.
- 5) Excellent package for good heat dissipation.



Package Marking and Ordering Information:

Part NO.	Marking	Package	Packing
DOP9N20	9N20	TO- 220	50 pcs/Tube

Absolute Maximum Ratings: ($T_C=25^\circ\text{C}$ 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	9	A
	Continuous Drain Current- $T_C=100^\circ\text{C}$	5.2	
I_{DM}	Pulsed Drain Current ¹	38	
P_D	Power Dissipation	88	W
E_{AS}	Single pulse avalanche energy ²	155	mJ
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55-+150	$^\circ\text{C}$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	1.42	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	62.5	$^\circ\text{C}/\text{W}$

Electrical Characteristics: ($T_C=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250 μ A	200	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =200V	---	---	1	μ A
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 μ A	2.5	---	3.5	V
R _{DS(ON)}	Drain-Source On Resistance ³	V _{GS} =10V, I _D =4.5A	---	0.22	0.3	Ω
Dynamic Characteristics						
C _{iss}	Input Capacitance ³	V _{DS} =25V, V _{GS} =0V, f=1MHz	---	536	---	pF
C _{oss}	Output Capacitance ³		---	90	--	
C _{rss}	Reverse Transfer Capacitance ³		---	23	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time ³	V _{DS} =100V, I _D =5.4A,	---	8	---	ns
t _{d(off)}	Turn-Off Delay Time ³	R _{ENG} =3.5 Ω	---	25	---	ns
Q _g	Total Gate Charge ³	V _{GS} =10V, V _{DS} =160V, I _D =5.4A	---	17	---	nc
Q _{gs}	Gate-Source Charge ³		---	2.2	---	nc
Q _{gd}	Gate-Drain “Miller” Charge ³		---	3.7	---	nc
Drain-Source Diode Characteristics						
V _{SD}	Diode Forward Voltage ³	V _{GS} =0V, I _{SD} =9A	---	---	1.45	V
I _S	Continuous Drain Curren	V _D =V _G =0V	---	---	9	A
I _{SM}	Pulsed Drain Current		---	---	38	A
T _{rr}	Reverse Recovery Time ³	I _F =9A, T _J =25 °C	---	120	176	ns
Q _{rr}	Reverse Recovery Charge ³	di/dt=100A/us	---	542	815	nc

Notes:

1. Repetitive rating: Pulse width limited by maximum junction temperature
2. Starting $T_J = 25^\circ\text{C}$, $V_{DD} = 50\text{V}$, $L = 3.5\text{ mH}$, $R_G = 25\Omega$, $I_{AS} = 9.0\text{A}$
3. Pulse Test : Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$

Typical Characteristics: ($T_C = 25^\circ\text{C}$ unless otherwise noted)

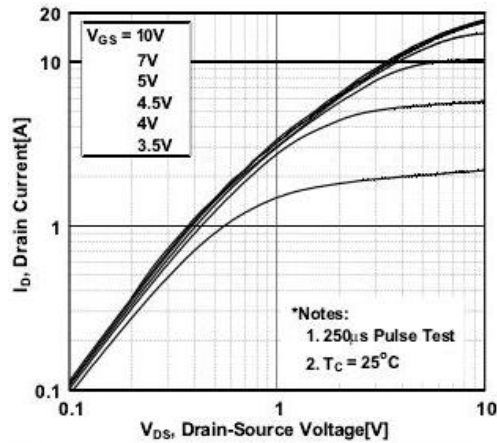


Fig1 Typical Output Characteristics, $T_C = 25^\circ\text{C}$

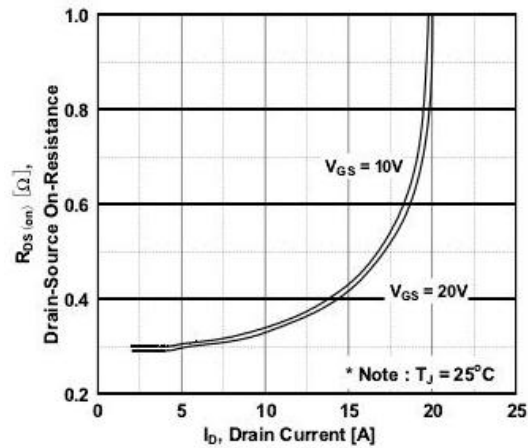


Fig2 On-Resistance Vs. Drain Current and Gate Voltage

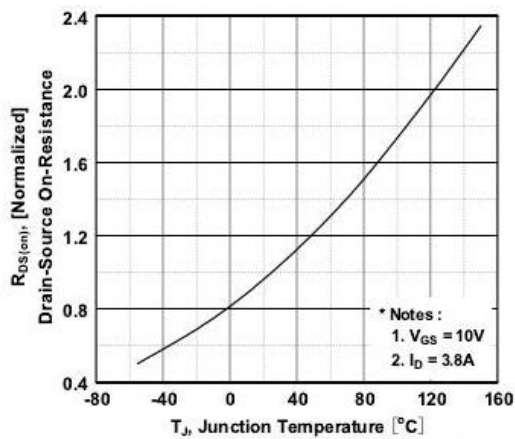


Fig3 Normalized On-Resistance Vs. Temperature

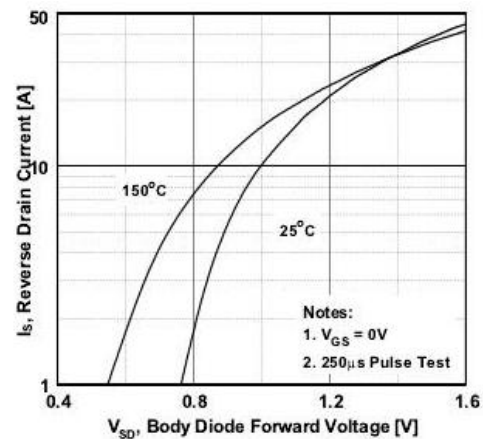


Fig4 Typical Source-Drain Diode Forward Voltage

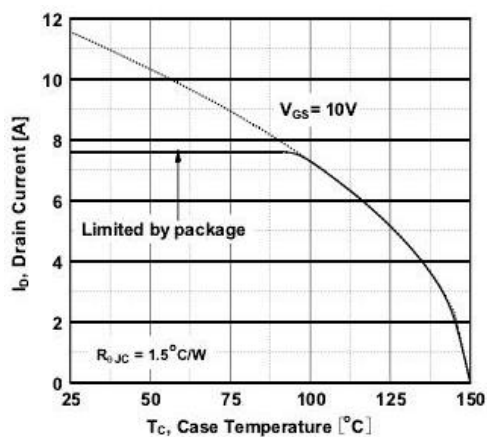


Fig5 Maximum Drain Current Vs. Case Temperature

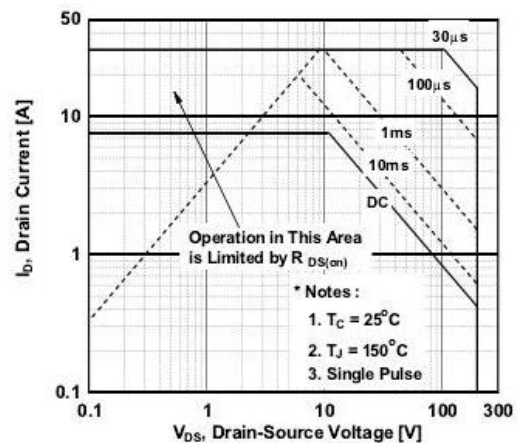
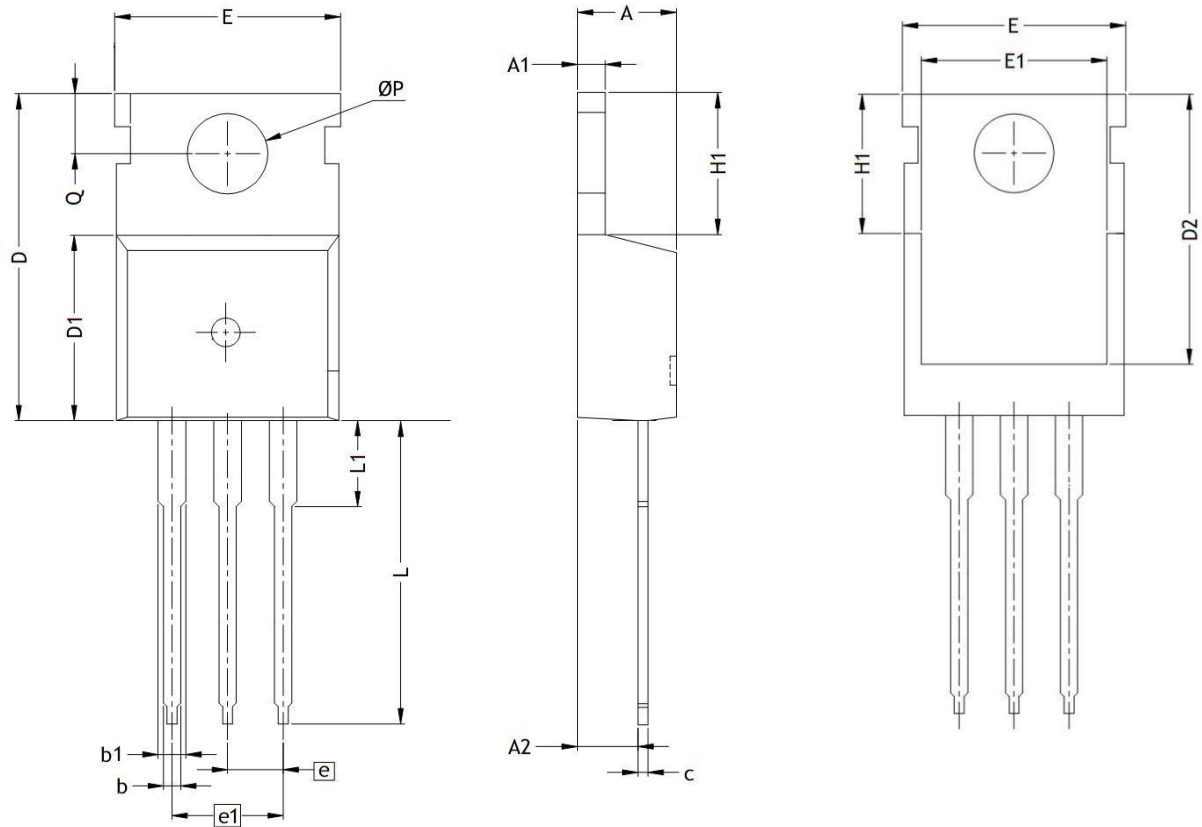


Fig6 Maximum Safe Operating Area

TO-220 Package Information:



UNIT: mm

SYMBOLS	A	A1	A2	b	b1	c	D	D1	D2	E	E1	e
MIN	4.25	1.25	2.35	0.7	1.15	0.45	14.35	8.80	13.05	9.90	7.85	2.540
MAX	4.65	1.35	2.55	0.9	1.75	0.60	15.95	9.50	13.65	10.35	8.85	BSC
SYMBOLS	e1	H1	L	L1	Q	φP						
MIN	5.080	6.30	12.85	2.85	2.70	3.50						
MAX	BSC	6.65	13.50	3.25	2.90	3.70						

Marking Information:

①. Doingter LOGO

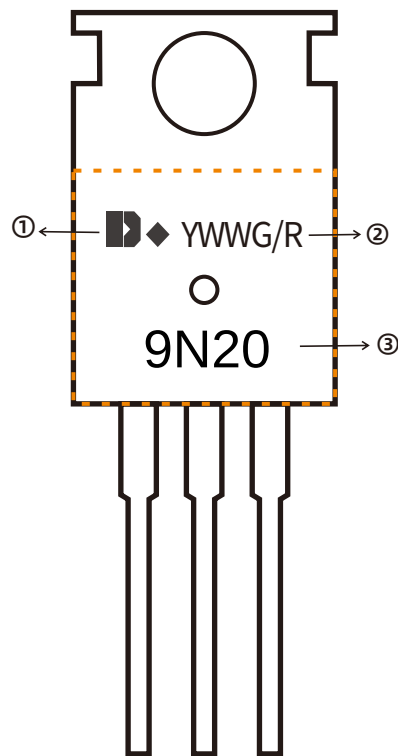
②. Date Code(YWWG / R)

Y : Year Code , last digit of the year

WW : Week Code(01-53)

G/R : G(Green) /R(Lead Free)

③. Part NO.



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