

Description:

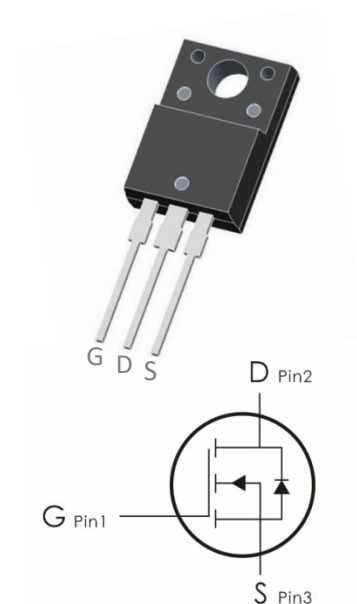
This N-Channel MOSFET uses advanced SGT technology and

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

It can be used in a wide variety of applications.

Features:

- 1) $V_{DS}=100V, I_D=40A, R_{DS(on)} < 11m\Omega @ V_{GS}=10V$ (Typ: $9.6m\Omega$)
- 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
DOPF40N10-L	40N10-L	TO- 220F	50 pcs/Tube

Absolute Maximum Ratings: ($T_C=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current	40	A
	Continuous Drain Current- $T_C=100^\circ C$	28	
I_{DM}	Pulsed Drain Current ¹	160	
P_D	Power Dissipation	38.5	W
E_{AS}	Single pulse avalanche energy ²	71	mJ
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55--+150	$^\circ C$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance,Junction to Case	3.2	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance,Junction to Ambient	60	$^\circ C/W$

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Sourctce Breakdown Voltage	V _{GS} =0V,I _D =250 μ A	100	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =100V	---	---	1	μ A
I _{GSS}	Gate-Source Leakage Current	V _{GS} =± 20V, V _{DS} =0A	---	---	± 100	nA
On Characteristics						
V _{GS(th)}	Gate-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250 μ A	1	1.8	2.5	V
R _{DS(ON)}	Drain-Source On Resistance ³	V _{GS} =10V,I _D =10A	---	9.6	11	m Ω
		V _{GS} =4.5V,I _D =10A	---	12	16	m Ω
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =50V, V _{GS} =0V, f=1MHz	---	1615	---	pF
C _{oss}	Output Capacitance		---	441	--	
C _{rss}	Reverse Transfer Capacitance		---	7.8	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DS} =50V, R _D =5 Ω , R _{ENG} =10 Ω ,V _{GS} =10V	---	9	---	ns
t _r	Rise Time		---	4	---	ns
t _{d(off)}	Turn-Off Delay Time		---	25	---	ns
t _f	Fall Time		---	4	---	ns
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =50V, I _D =20A	---	31.5	---	nC
Q _{gs}	Gate-Source Charge		---	3	---	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	14.7	---	nC
Drain-Source Diode Characteristics						
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _{SD} =20A	---	---	1.3	V
I _S	Continuous Drain Curren	V _D =V _G =0V	---	---	40	A
I _{SM}	Pulsed Drain Current		---	---	160	A

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition : $T_J=25^{\circ}\text{C}, V_{DD}=50V, V_G=10V, L=0.5mH$
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 0.5\%$

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

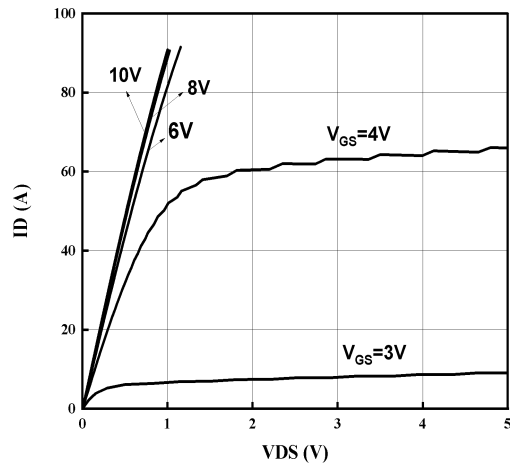


Fig1. Typical Output Characteristics

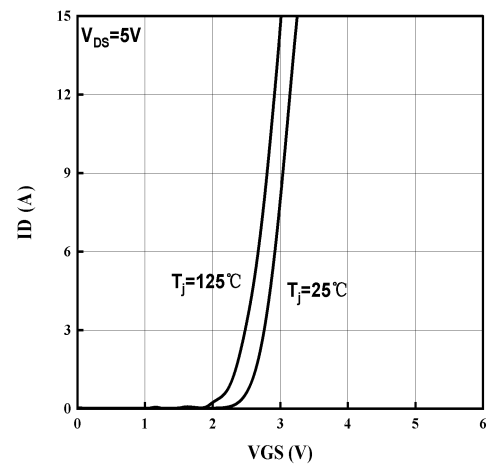


Fig2. Typical Transfer Characteristics

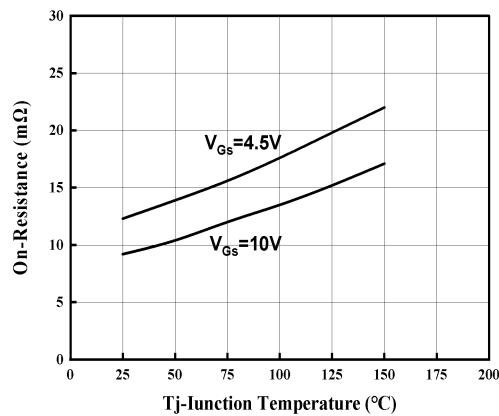


Fig3. On-Resistance Vs. Temperature

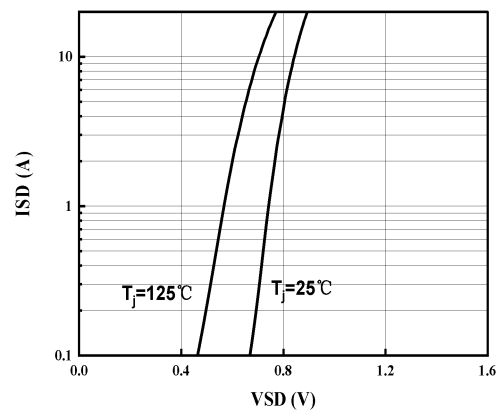


Fig4. Typical Source-Drain Diode Forward Voltage

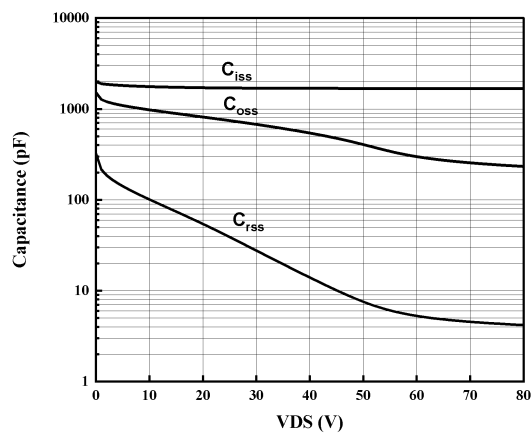


Fig5. Typical Capacitance

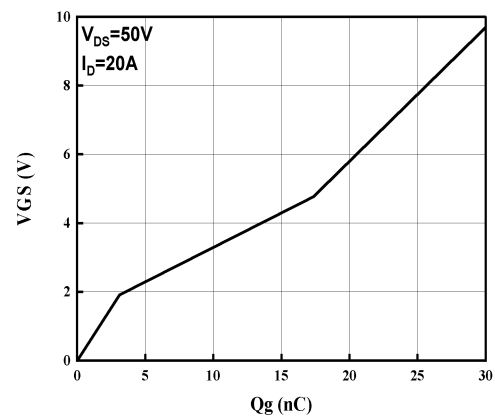


Fig6. Typical Gate Charge

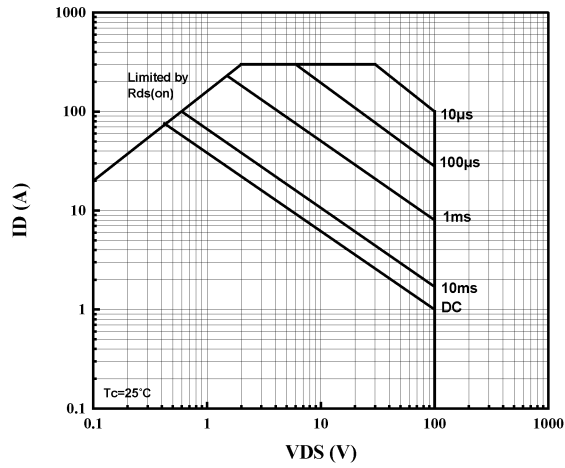


Fig7. Safe Operating Area

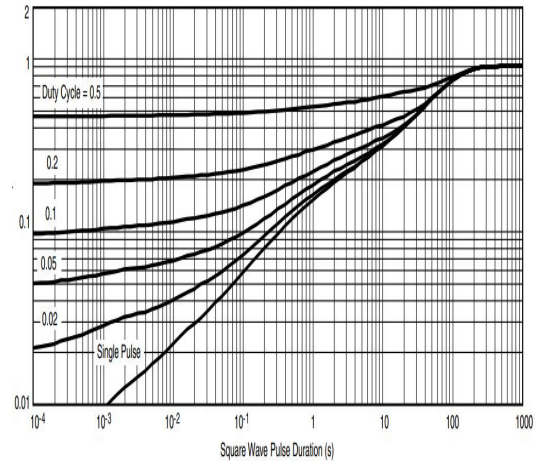
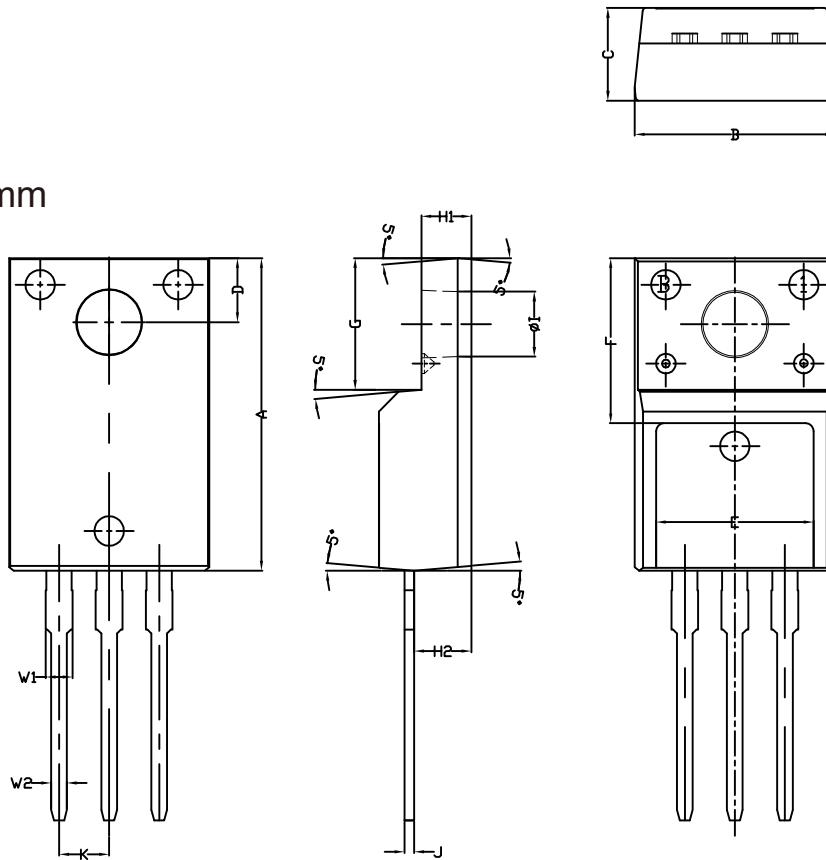


Fig8. Normalized transient thermal impedance

TO-220F Package Information:

Unit:mm



	MM			Inch		
Symbol	Min	Mim	Max	Min	Mim	Max
A	15.67	15.87	16.07	0.6169	0.6248	0.6328
B	9.86	10.16	10.46	0.3882	0.4000	0.4118
C	4.50	4.70	4.90	0.1772	0.1850	0.1929
D	3.15	3.35	3.55	0.1240	0.1319	0.1398
E	7.80	8.00	8.20	0.3071	0.3150	0.3228
F	8.18	8.38	8.58	0.3220	0.3299	0.3378
H1	2.34	2.54	2.84	0.0921	0.1000	0.1118
H2	2.40	2.90	3.40	0.0945	0.1141	0.1339
I	3.10	3.30	3.50	0.1220	0.1299	0.1378
W1	1.08	1.28	1.48	0.0425	0.0504	0.0583
W2	0.70	0.80	0.90	0.0276	0.0315	0.0354
K	2.44	2.54	2.64	0.0961	0.1000	0.1039
G	6.48	6.68	6.88	0.2551	0.2630	0.2709
J	0.45	0.50	0.6	0.0177	0.0197	0.0236

Marking Information:

①. Doingter LOGO

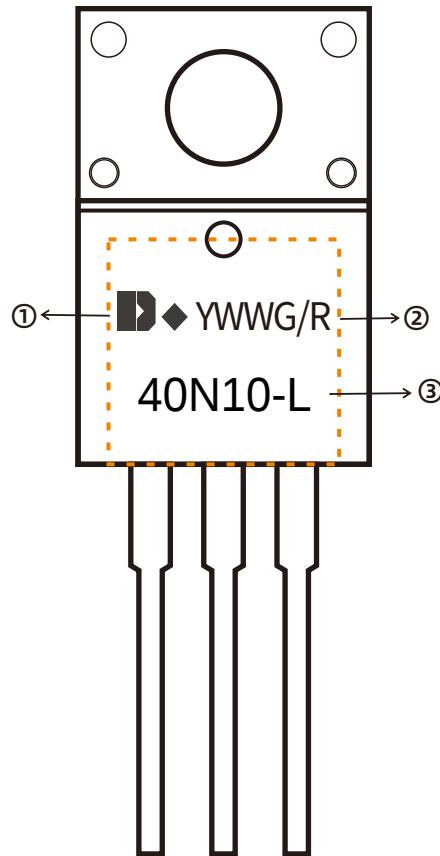
②. Date Code(YWWG / R)

Y : Year Code , last digit of the year

WW : Week Code(01-53)

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

③. Part NO.



Previous Version

Version	Date	Subjects (major changes since last revision)
1.0	2024-10-12	Release of final version

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V1.0