

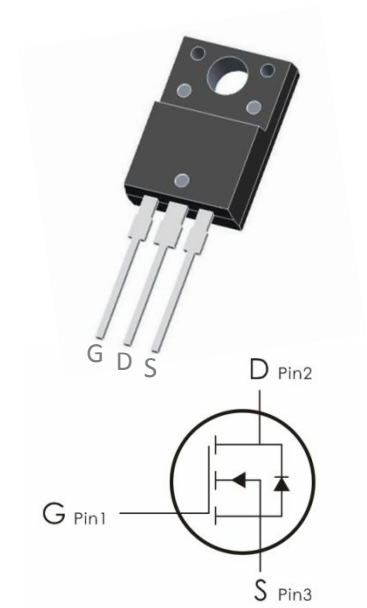
Description:

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) $V_{DS}=650V, I_D=20A, R_{DS(on)} < 350m\Omega @ V_{GS}=10V$ (Typ: $320m\Omega$)
- 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
DOPF20N65	20N65	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	650	V
V_{GS}	Gate-Source Voltage	± 30	V
I_D	Continuous Drain Current	20	A
	Continuous Drain Current- $T_c=100^\circ C$	14	
I_{DM}	Pulsed Drain Current ¹	80	
P_D	Power Dissipation	85	W
E_{AS}	Single pulse avalanche energy ²	1200	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	1.47	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	100	$^\circ C/W$

Electrical Characteristics: (Tc=25℃ 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	650	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =650V	---	---	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	---	4	V
R _{DS(ON)}	Drain-Source On Resistance ³	V _{GS} =10V, I _D =10A	---	320	350	m Ω
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1MHz	---	2864	---	pF
C _{oss}	Output Capacitance		---	226.1	--	
C _{rss}	Reverse Transfer Capacitance		---	14.3	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DS} =300V, I _D =20A, R _{ENG} =25 Ω ,V _{GS} =10V	---	36.1	---	ns
t _r	Rise Time		---	73.3	---	ns
t _{d(off)}	Turn-Off Delay Time		---	166.8	---	ns
t _f	Fall Time		---	73.3	---	ns
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =300V, I _D =20A	---	53.2	---	nC
Q _{gs}	Gate-Source Charge		---	15.5	---	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	10.3	---	nC
Drain-Source Diode Characteristics						
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _{SD} =20A	---	---	1.5	V
I _S	Continuous Drain Current	V _D =V _G =0V	---	---	20	A
I _{SM}	Pulsed Drain Current		---	---	80	A
T _{rr}	Reverse Recovery Time	I _F =20A, T _J =25 °C	---	425	---	ns
Q _{rr}	Reverse Recovery Charge	di/dt=100A/us	---	3.7	---	nC

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition : T_J=25℃, V_{DD}=325V, V_G=10V, L=0.5mH
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

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

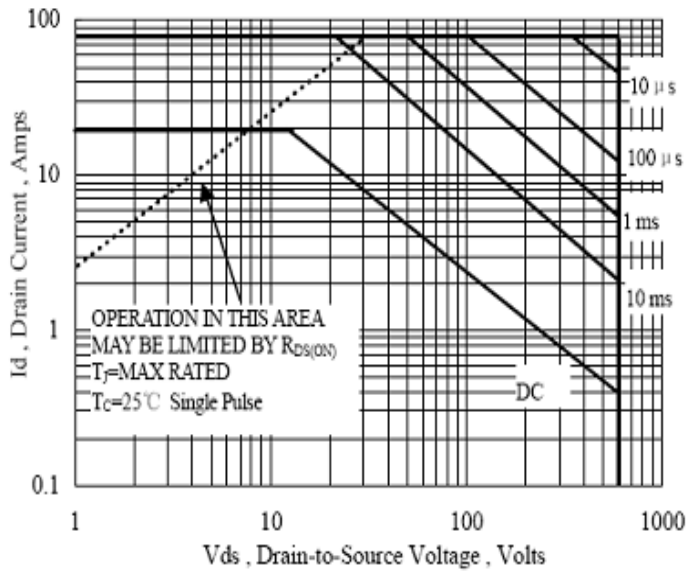


Figure 1 Maximum Forward Bias Safe Operating Area

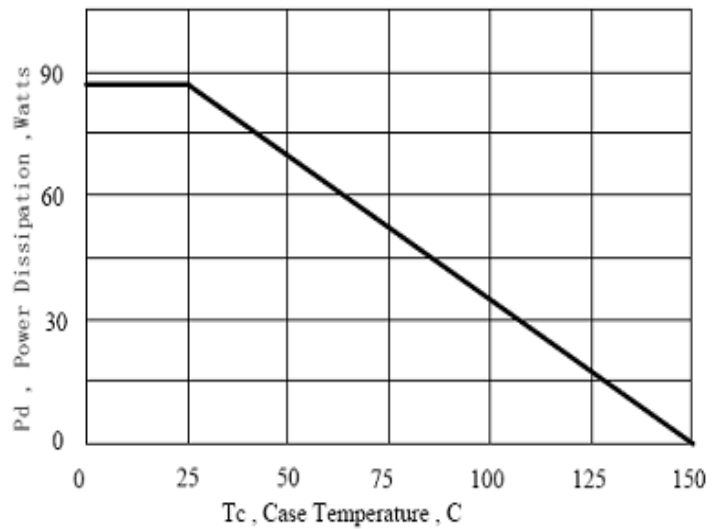


Figure 2 Maximum Power Dissipation vs Case Temperature

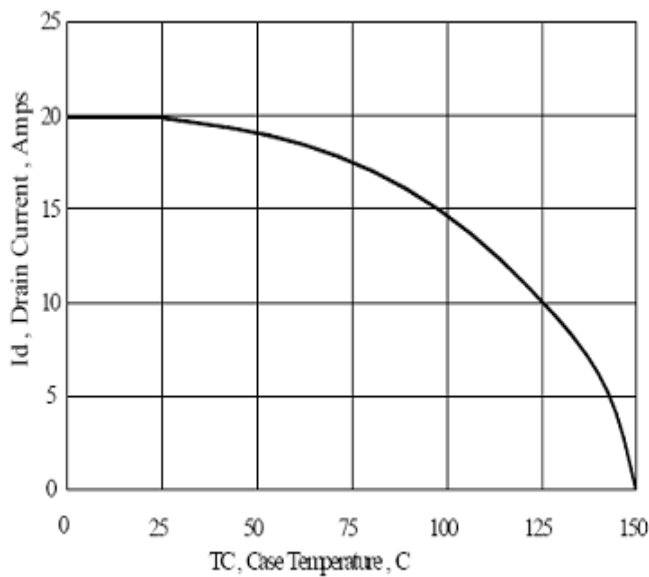


Figure 3 Maximum Continuous Drain Current vs Case Temperature

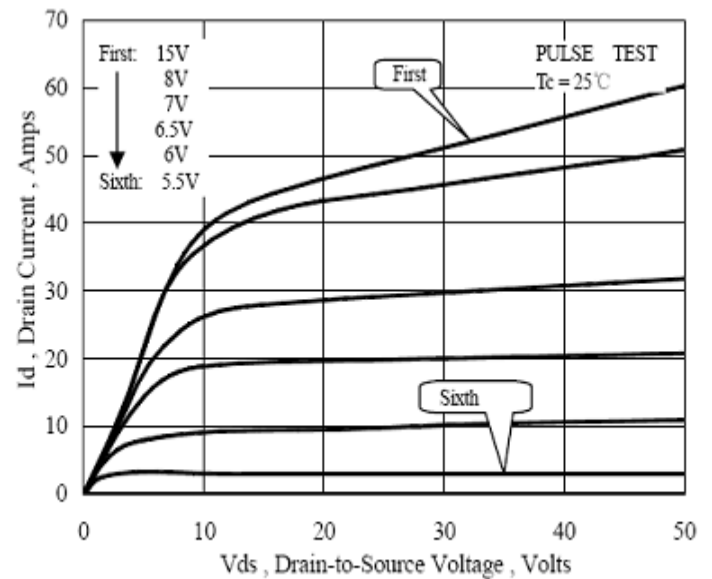


Figure 4 Typical Output Characteristics

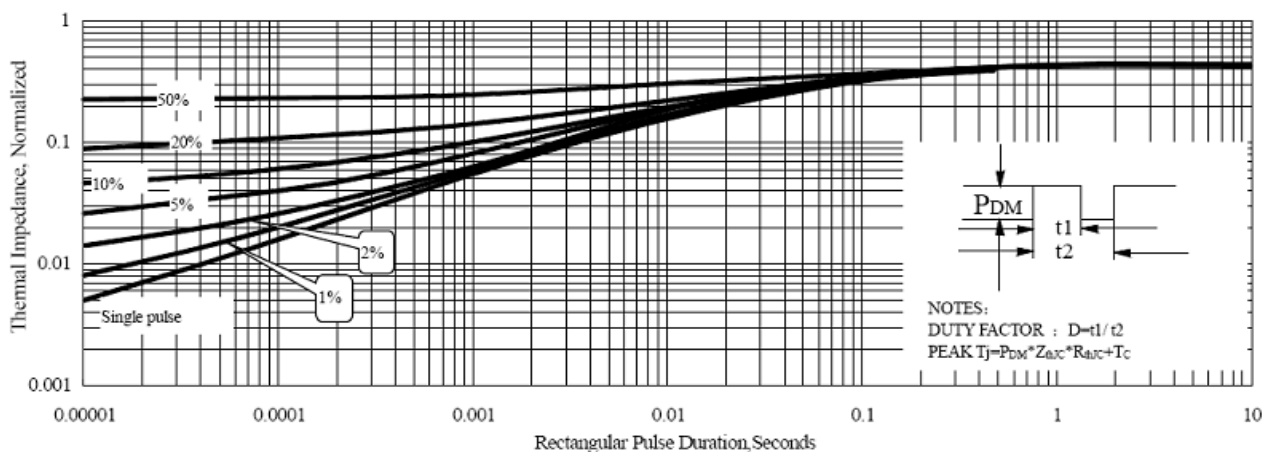


Figure 5 Maximum Effective Thermal Impedance, Junction to Case

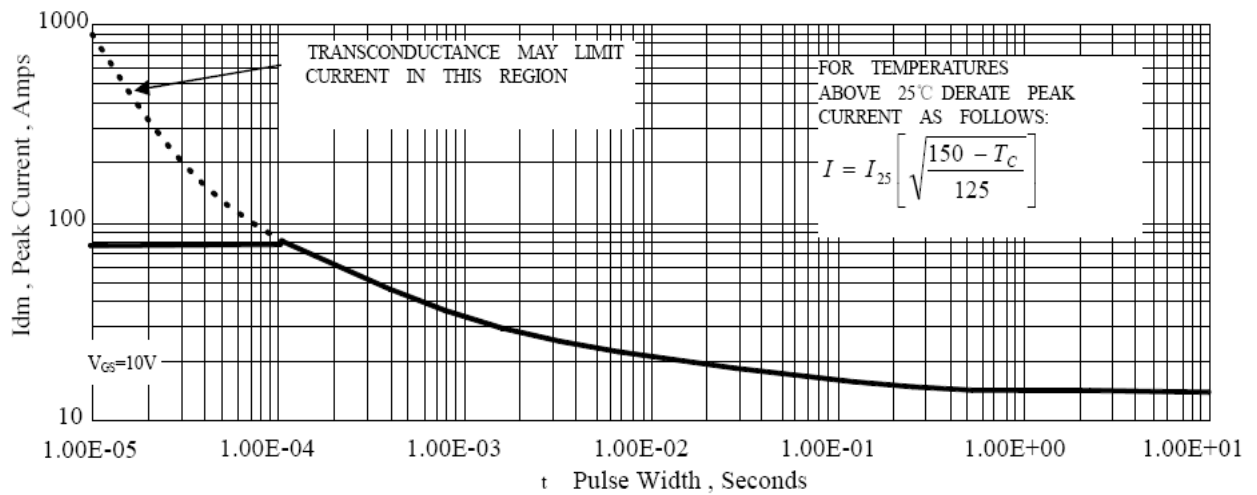


Figure 6 Maximum Peak Current Capability

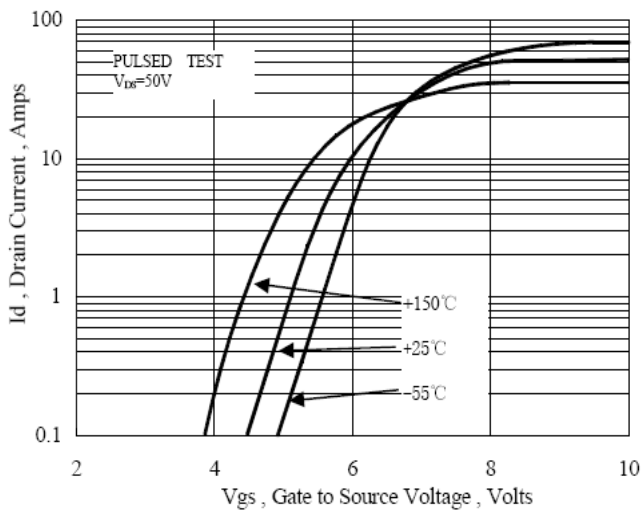


Figure 7 Typical Transfer Characteristics

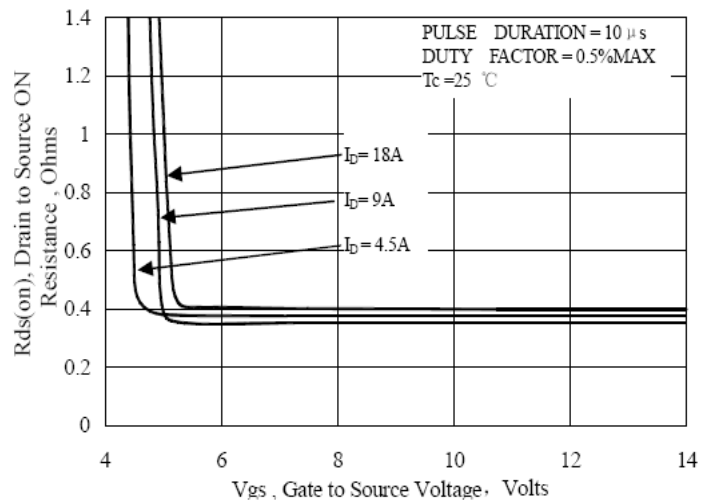


Figure 8 Typical Drain to Source ON Resistance vs Gate Voltage and Drain Current

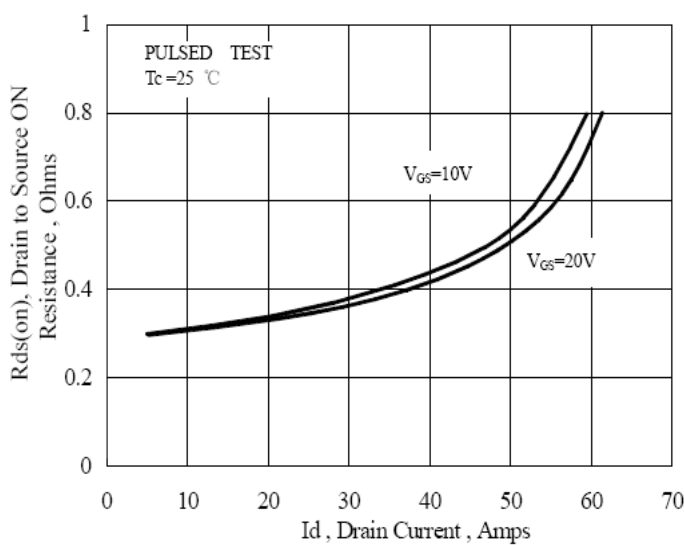


Figure 9 Typical Drain to Source ON Resistance vs Drain Current

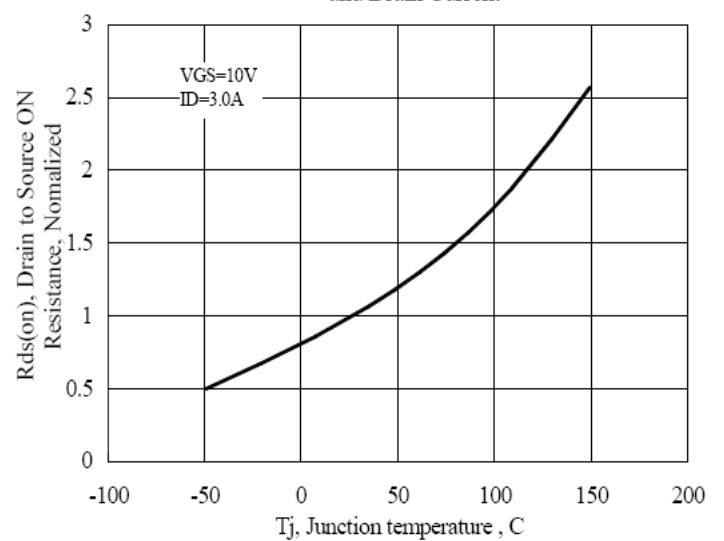


Figure 10 Typical Drain to Source ON Resistance vs Junction Temperature

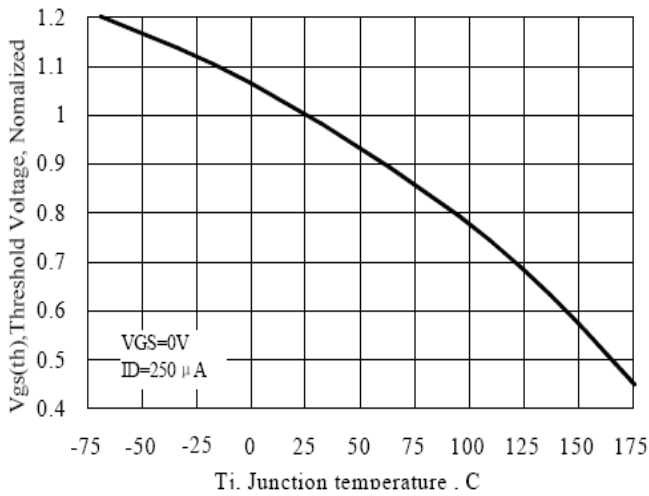


Figure 11 Typical Threshold Voltage vs Junction Temperature

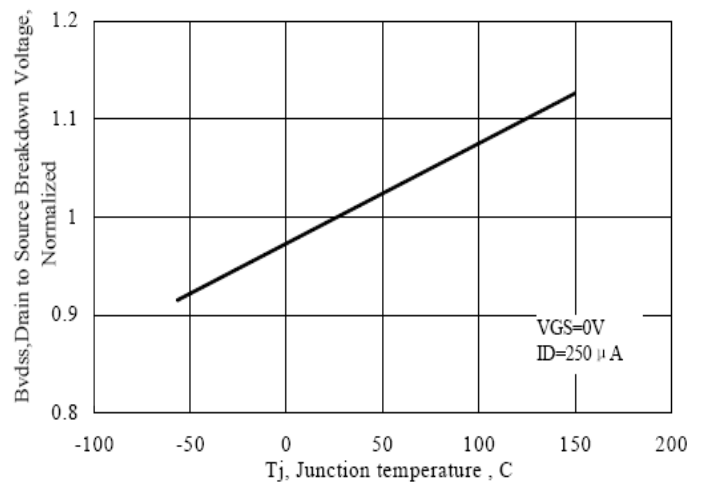


Figure 12 Typical Breakdown Voltage vs Junction Temperature

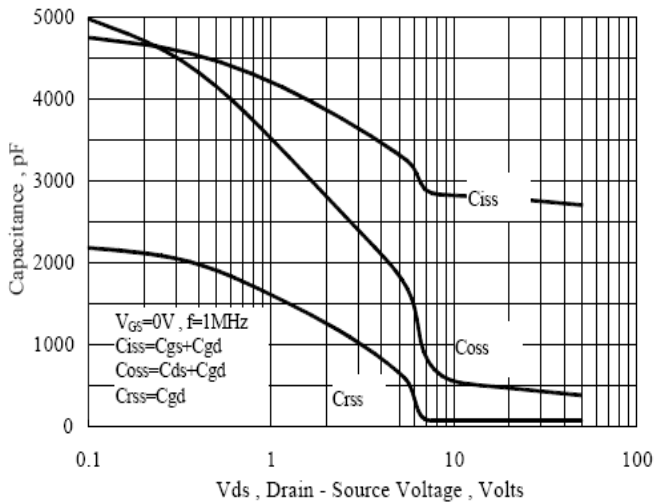


Figure 13 Typical Capacitance vs Drain to Source Voltage

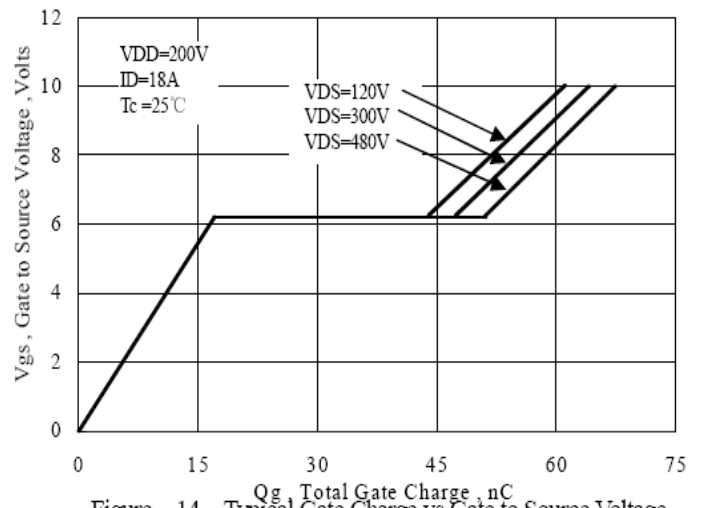


Figure 14 Typical Gate Charge vs Gate to Source Voltage

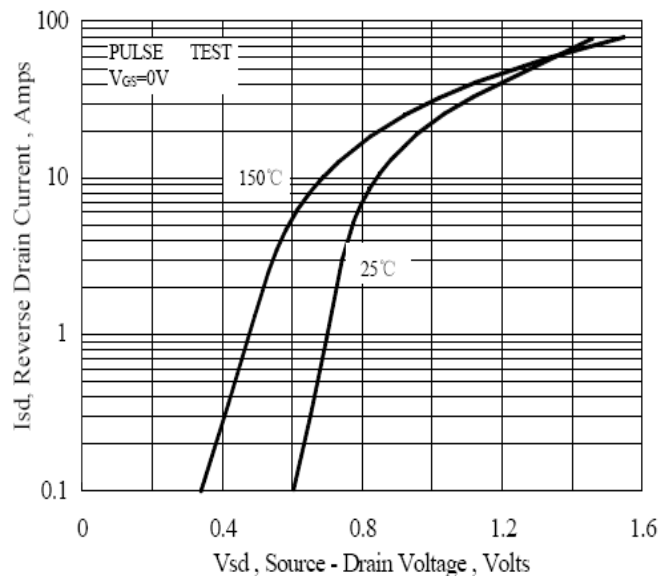


Figure 15 Typical Body Diode Transfer Characteristics

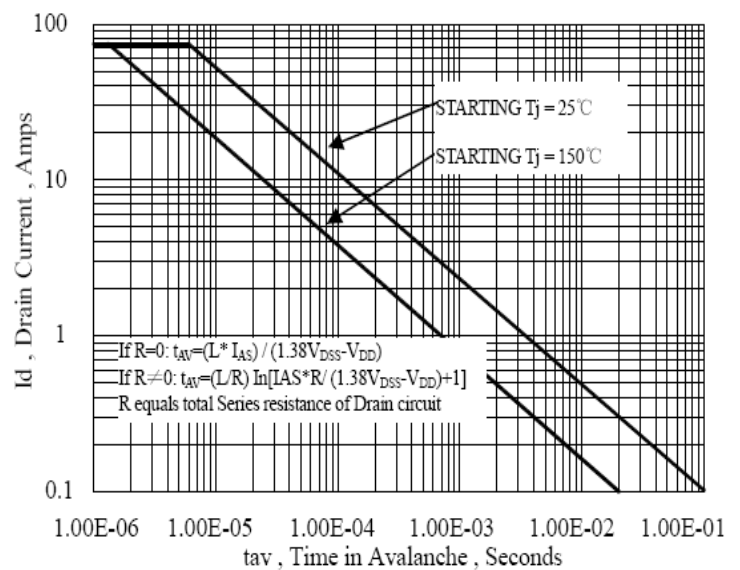
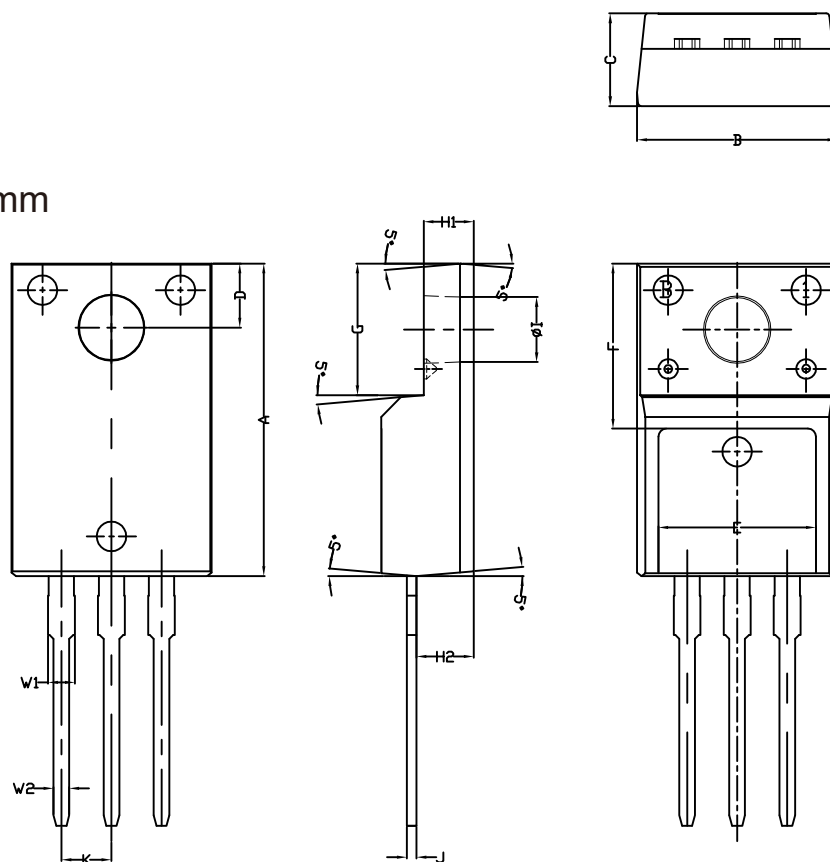


Figure 16 Unclamped Inductive Switching Capability

TO-220F Package Information:

Unit:mm



Symbol	MM			Inch		
	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

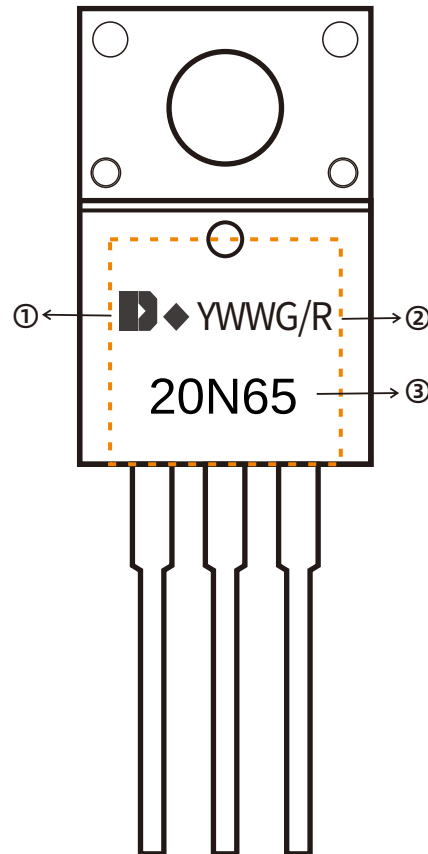
②. Date Code(YWWG / R)

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	2024-09-16	Release of final version

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V1.0