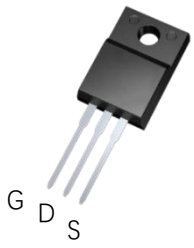
800V 10A 0.91Ω N-ch Power MOSFET

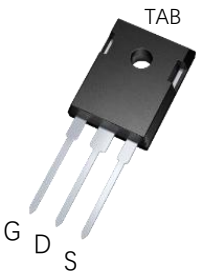
Description

WMOS™ D1 is Wayon's 1st generation VDMOS family that is dramatic reduction in on-resistance and ultra-low gate charge for applications requiring high power density and high efficiency. And it is very robust and RoHS compliant.

TO-220F



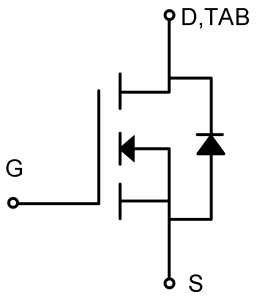
TO-247



Features

- Typ.$R_{DS(on)}$=0.91Ω@V_{GS}=10V
- 100% avalanche tested
- Pb-free, Halogen free

RoHS compliant



Applications

- SMPS
- Charger
- DC-DC

Absolute Maximum Ratings (Tc=25℃)

Parameter	Symbol	WML10N80D1	WMJ10N80D1	Unit
Drain-source voltage	V_{DSS}	800		V
Gate-source voltage	V_{GS}	±30		V
Continuous drain current	I_D	10		A
Pulsed drain current	I_{DM}	40		A
Avalanche energy, single pulse	E_{AS}	930		mJ
Power dissipation	P_D	62.5	215	W
Derate above 25°C		0.5	1.72	W/℃
Operating junction temperature	T_j	-55~150		℃
Storage temperature	T_{stg}	-55~150		℃
Continuous diode forward current	I_S	10		A
Diode pulse current	I_{Spulse}	40		A

Thermal Characteristic

Thermal resistance,junction-to-case	$R_{\theta JC}$	2	0.58	℃/W
Thermal resistance,junction-to-ambient	$R_{\theta JA}$	62.5	62.5	℃/W

Electrical Characteristics of MOSFET

				Min.	Typ.	Max.	
Drain-source break down voltage	BV_{DSS}	I_D=250uA, V_{GS}=0V	T_C=25℃	800	-	-	V
Gate threshold voltage	$V_{GS(th)}$	I_D=250uA, V_{DS}=V_{GS}	T_J=25℃	2.5	3.5	4.5	V
Drain-source leakage current	I_{DSS}	V_{DS}=800V, V_{GS}=0V	T_J=25℃	-	-	1	uA
		V_{DS}=640V, V_{GS}=0V	T_J=125℃	-	-	400	uA
Gate-source leakage current,forward	I_{GSSF}	V_{DS}=0V, V_{GS}=30V	T_J=25℃	-	-	100	nA
Gate-source leakage current,reverse	I_{GSSR}	V_{DS}=0V, V_{GS}=-30V	T_J=25℃	-	-	-100	nA
Drain-source on-state resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=5A	T_J=25℃	-	0.91	1.15	Ω
Transconductance	G_{fs}	V_{DS}=20V	T_J=25℃	-	9.3	-	S

Dynamic Characteristics of MOSFET (TC=25℃)

			Min.	Typ.	Max.	
Input capacitance	C_{iss}	f=1MHz, V_{DS}=25V, V_{GS}=0V	-	1590	-	pF
Output capacitance	C_{oss}		-	157	-	pF
Reverse transfer capacitance	C_{rss}		-	8.4	-	pF
Gate to source charge	Q_{gs}	V_{DD}=400V	-	9.4	-	nC
Gate to drain charge	Q_{gd}	I_D=10A	-	9	-	nC
Total gate charge	Q_g	V_{GS}= 0 to10V	-	33	-	nC

Switching Characteristics of MOSFET (TC=25℃)

			Min.	Typ.	Max.	
Turn-on delay time	$t_{d\ on}$	V_{DS}=400V, I_D=10A, R_G=25Ω, V_{GS}=0 to 10V	-	28	-	ns
Rise time	t_r		-	46	-	ns
Turn-off delay time	$t_{d\ off}$		-	112	-	ns
Fall time	t_f		-	50	-	ns

Characteristics of Body Diode (TC=25℃)

			Min.	Typ.	Max.	
Forward voltage	V_{SD}	I_{SD}=10A, V_{GS}=0V	-	-	1.5	V
Reverse recovery time	t_{rr}	V_{DS}=400V, I_S=10A, V_{GS}=10V -di/dt=100A/us	-	522	-	ns
Reverse recovery current	I_{rr}		-	21	-	A
Recovery charge	Q_{rr}		-	11	-	uC

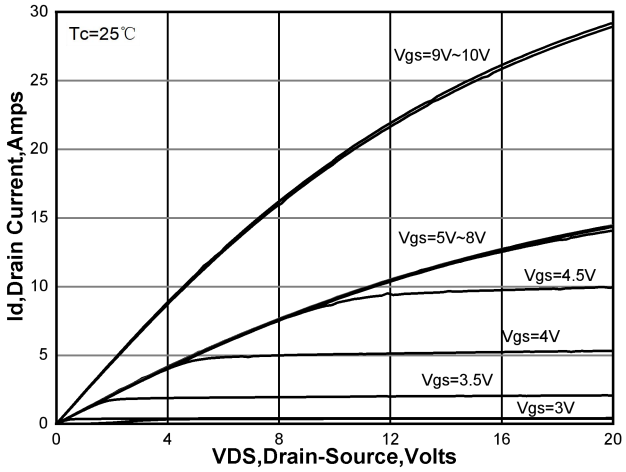


Figure 1.On-Region Characteristics

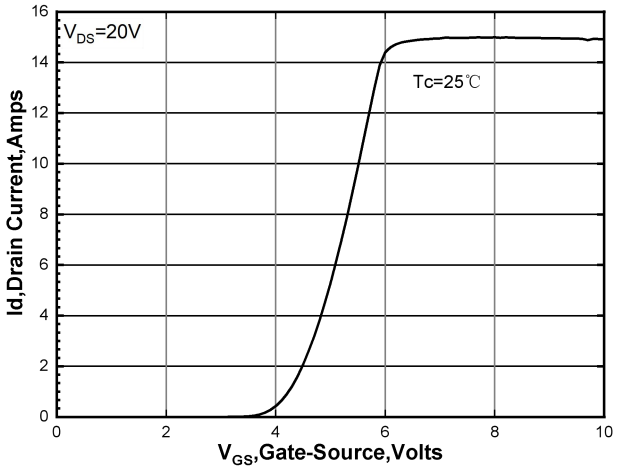


Figure 2. Transfer Characteristics

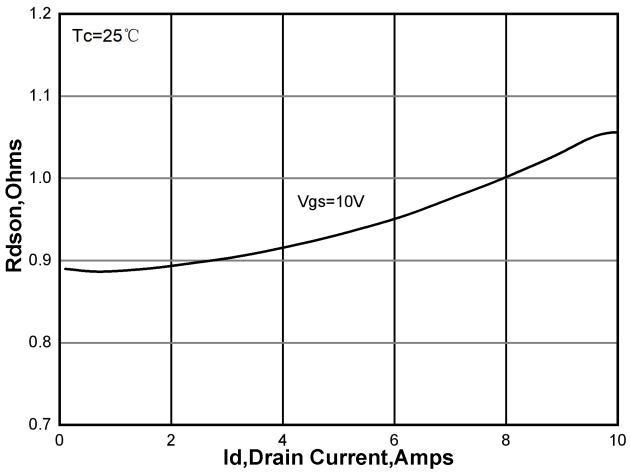


Figure 3.Static Drain-Source On Resistance

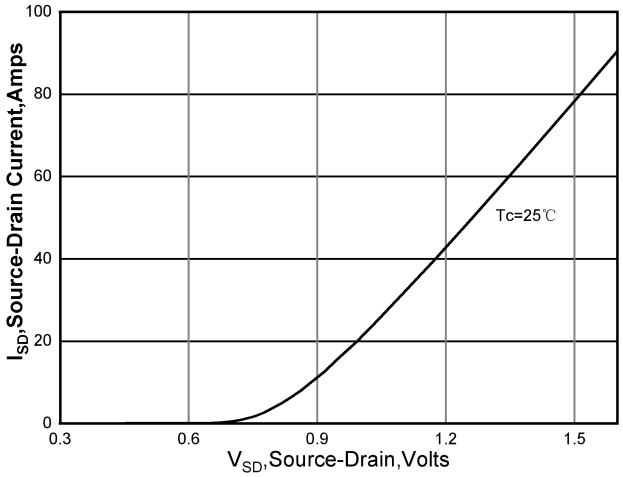


Figure 4. Normalized VGs(th) vs.Temperature

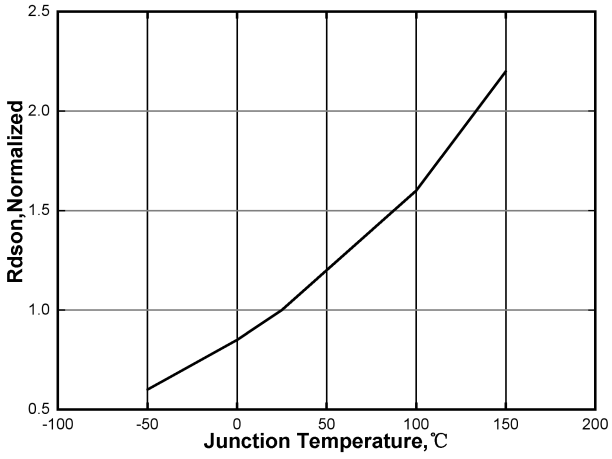


Figure 5. Normalized $R_{DS(on)}$ vs.Temperature

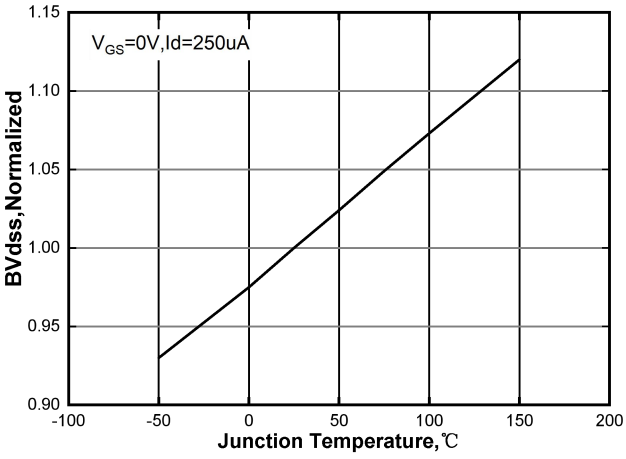


Figure 6. Normalized BV_{DSS} vs.Temperature

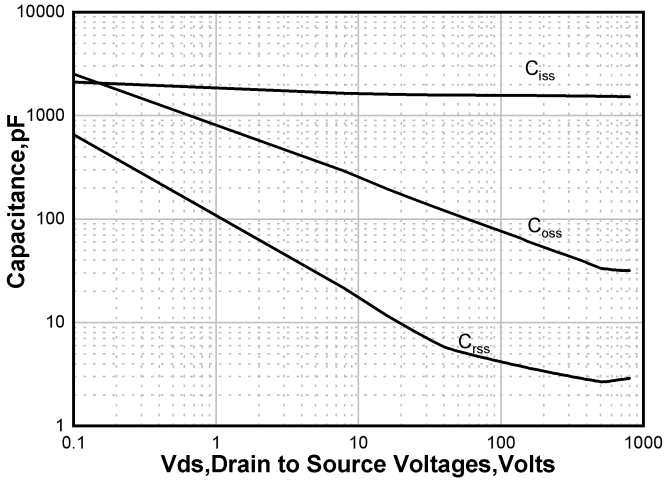


Figure 7. Capacitance Characteristics

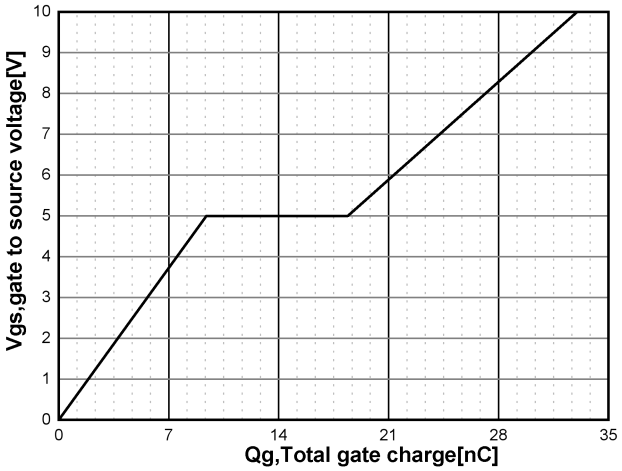


Figure 8. Gate Charge Characteristics

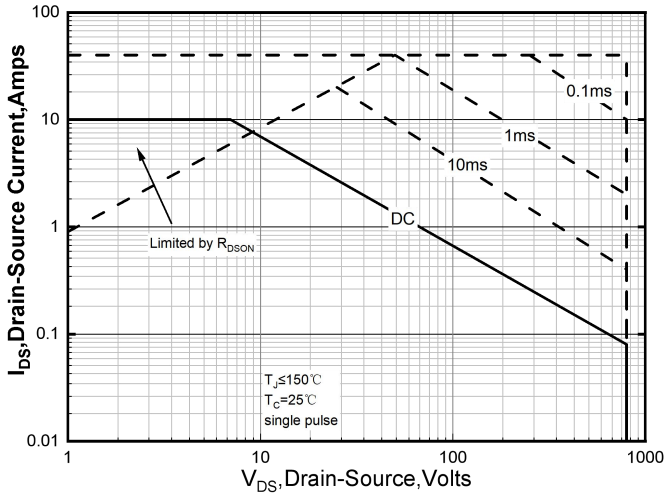


Figure 9. Maximum Safe Operating Area (TO-220F)

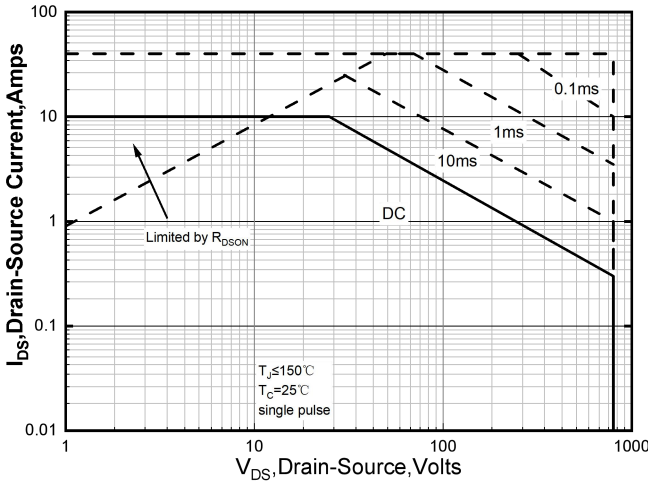
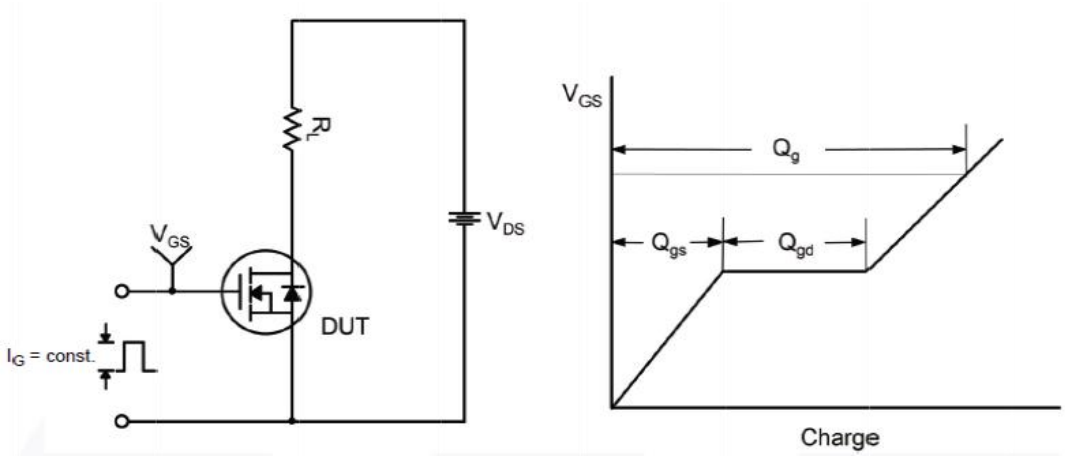
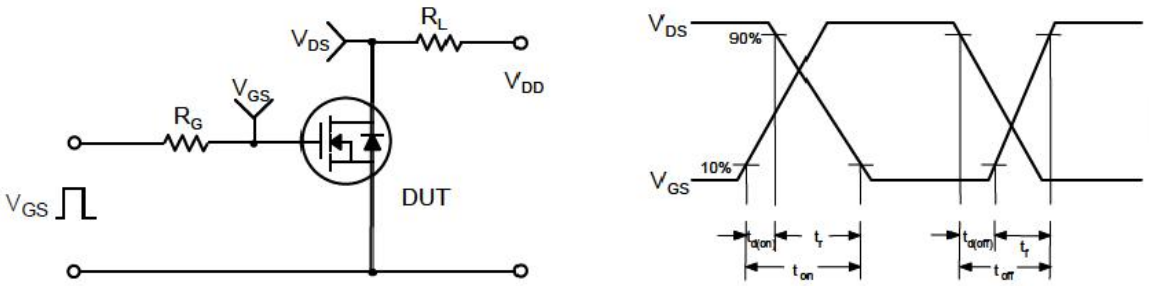


Figure 10. Maximum Safe Operating Area (TO-252)

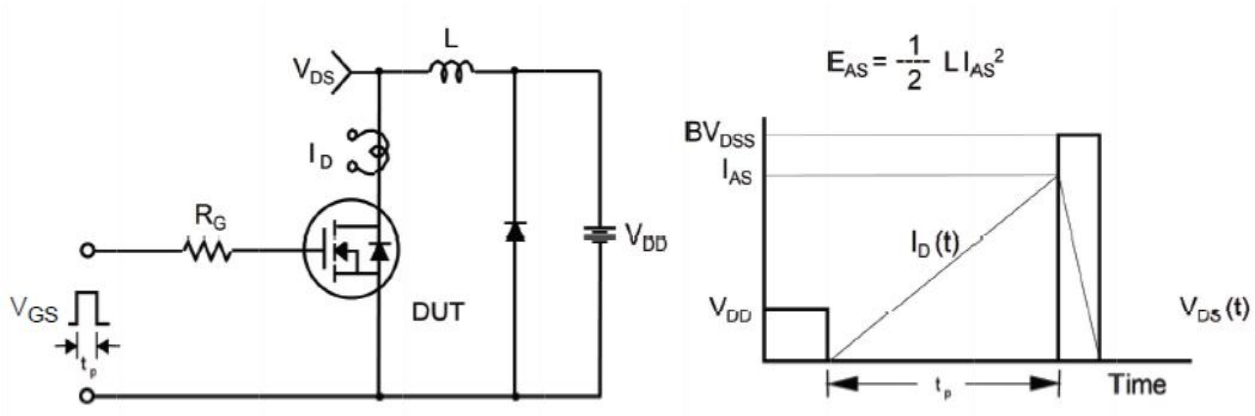
Gate Charge Test Circuit &Waveform



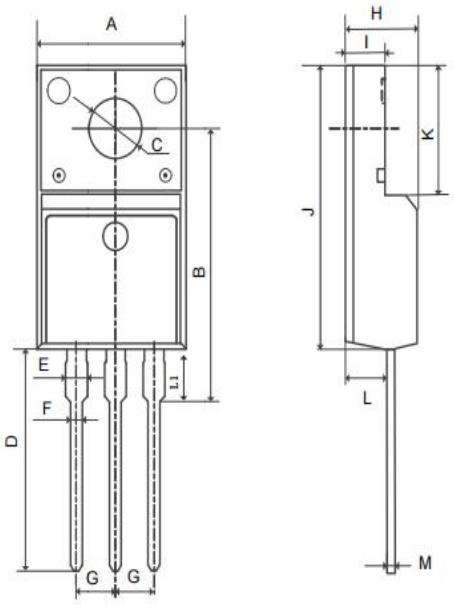
Switching Test Circuit &Waveforms



Unclamped Inductive Switching Test Circuit &Waveforms



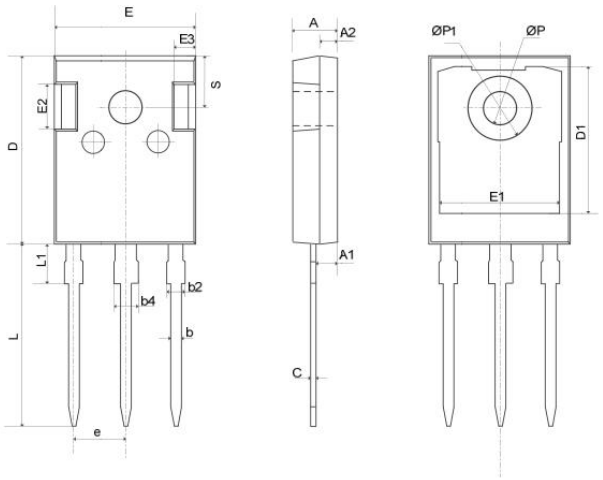
Mechanical Dimensions for TO-220F



COMMON DIMENSIONS

SYMBOL	MM	
	MIN	MAX
A	9.96	10.36
B	15.10	16.10
C	3.03	3.38
D	12.64	13.28
E	1.18	1.58
F	0.70	0.95
G	2.54REF	
H	4.50	4.90
I	2.34	2.74
J	15.57	16.17
K	6.70REF	
L	2.56	2.96
M	0.40	0.65
L1	2.85	3.45

Mechanical Dimensions for TO-247



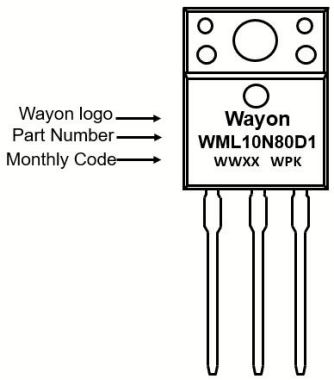
COMMON DIMENSIONS

SYMBOL	MM	
	MIN	MAX
A	4.80	5.20
A1	2.21	2.61
A2	1.85	2.15
b	1.11	1.36
b2	1.91	2.21
b4	2.91	3.21
c	0.51	0.75
D	20.70	21.30
D1	16.25	16.85
E	15.50	16.10
E1	13.00	13.60
E2	4.80	5.20
E3	2.30	2.70
e	5.44BSC	
L	19.62	20.22
L1	—	4.30
ØP	3.40	3.80
ØP1	—	7.30
S	6.15BSC	

Ordering Information

Part	Package	Marking	Packing method
WML10N80D1	TO-220F	WML10N80D1	Tube
WMJ10N80D1	TO-247	WMJ10N80D1	Tube

Marking Information



Contact Information

No.1001, Shiwan(7) Road, Pudong District, Shanghai, P.R.China.201202
Tel: 86-21-50310888 Fax: 86-21-50757680 Email: market@way-on.com
WAYON website: **http://www.way-on.com**
For additional information, please contact your local Sales Representative.

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