

800V 6A 2.5Ω N-ch Power MOSFET

Description

WMOST™ 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.

Features

- Typ. $R_{DS(on)}=2.5\Omega@V_{GS}=10V$
- 100% avalanche tested
- Pb-free, Halogen free

Applications

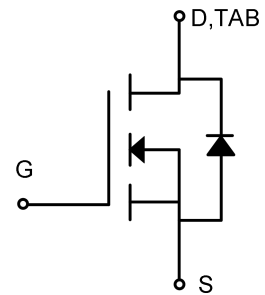
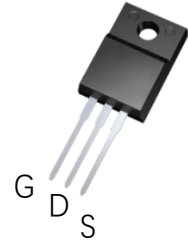
- SMPS
- Charger
- DC-DC



TO-252



TO-220F



Absolute Maximum Ratings ($T_c=25^\circ\text{C}$)

Parameter	Symbol	WMO6N80D1	WML6N80D1	Unit
Drain-source voltage	V_{DSS}	800		V
Gate-source voltage	V_{GS}	± 30		V
Continuous drain current	I_D	6		A
Pulsed drain current	I_{DM}	24		A
Avalanche energy, single pulse	E_{AS}	180		mJ
Power dissipation	P_D	45.8	41.7	W
Derate above 25°C		0.4	0.33	W/°C
Operating junction temperature	T_j	-55~150		°C
Storage temperature	T_{stg}	-55~150		°C
Continuous diode forward current	I_S	6		A
Diode pulse current	I_{Spulse}	24		A

Thermal Characteristic

Thermal resistance, junction-to-case	$R_{\theta JC}$	2.73	3	°C/W
Thermal resistance, junction-to-ambient	$R_{\theta JA}$	62	62.5	°C/W

Electrical Characteristics of MOSFET

				Min.	Typ.	Max.	
Drain-source break down voltage	BV_{DSS}	$I_D=250\mu A, V_{GS}=0V$	$T_C=25^\circ C$	800	-	-	V
Gate threshold voltage	$V_{GS(th)}$	$I_D=250\mu A, V_{DS}=V_{GS}$	$T_J=25^\circ C$	2	3.2	4	V
Drain-source leakage current	I_{DSS}	$V_{DS}=800V, V_{GS}=0V$	$T_J=25^\circ C$	-	-	1	μA
		$V_{DS}=640V, V_{GS}=0V$	$T_J=125^\circ C$	-	-	400	μA
Gate-source leakage current,forward	I_{GSSF}	$V_{DS}=0V, V_{GS}=30V$	$T_J=25^\circ C$	-	-	100	nA
Gate-source leakage current,reverse	I_{GSSR}	$V_{DS}=0V, V_{GS}=-30V$	$T_J=25^\circ C$	-	-	-100	nA
Drain-source on-state resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=3A$	$T_J=25^\circ C$	-	2.5	2.8	Ω
Transconductance	G_{fs}	$V_{DS}=20V$	$T_J=25^\circ C$	-	2.8	-	S

Dynamic Characteristics of MOSFET ($T_C=25^\circ C$)

				Min.	Typ.	Max.	
Input capacitance	C_{iss}	$f=1MHz, V_{DS}=25V, V_{GS}=0V$		-	841	-	pF
Output capacitance	C_{oss}			-	118	-	pF
Reverse transfer capacitance	C_{rss}			-	30.1	-	pF
Gate to source charge	Q_{gs}	$V_{DD}=400V$		-	7.68	-	nC
Gate to drain charge	Q_{gd}	$I_D=3A$		-	8.28	-	nC
Total gate charge	Q_g	$V_{GS}=0$ to 10V		-	29	-	nC

Switching Characteristics of MOSFET ($T_C=25^\circ C$)

				Min.	Typ.	Max.	
Turn-on delay time	$t_{d on}$	$V_{DS}=400V, I_D=3A, R_G=25\Omega,$ $V_{GS}=10V$		-	15.4	-	ns
Rise time	t_r			-	27.6	-	ns
Turn-off delay time	$t_{d off}$			-	45	-	ns
Fall time	t_f			-	27.2	-	ns

Characteristics of Body Diode ($T_C=25^\circ C$)

				Min.	Typ.	Max.	
Forward voltage	V_{SD}	$I_{SD}=3A, V_{GS}=0V$		-	-	1.4	V
Reverse recovery time	t_{rr}	$I_S=3A, V_{DD}=400V$ $di/dt=100A/\mu s$		-	446	-	ns
Reverse recovery current	I_{rr}			-	27.3	-	A
Recovery charge	Q_{rr}			-	6.1	-	μC

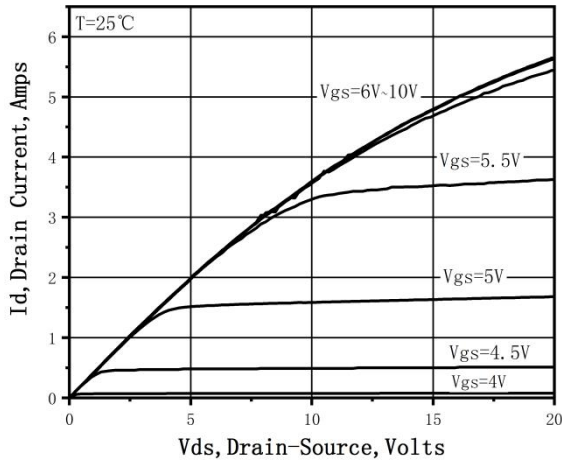


Figure 1. On-Region Characteristics

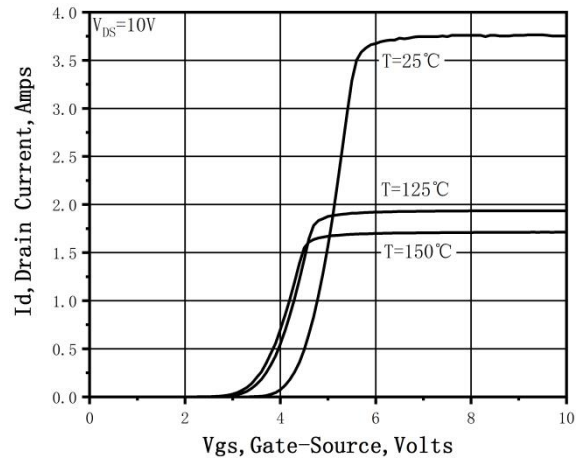


Figure 2. Transfer Characteristics

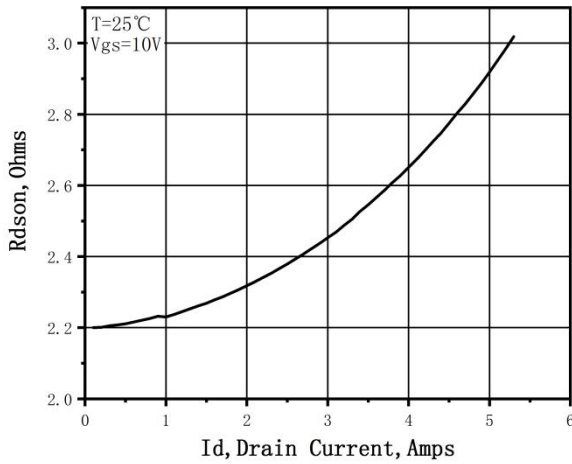


Figure 3. Static Drain-Source On Resistance

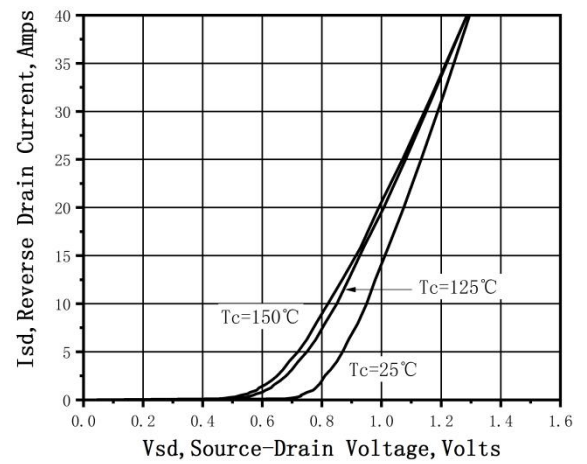


Figure 4. Typical Body Diode Transfer Characteristics

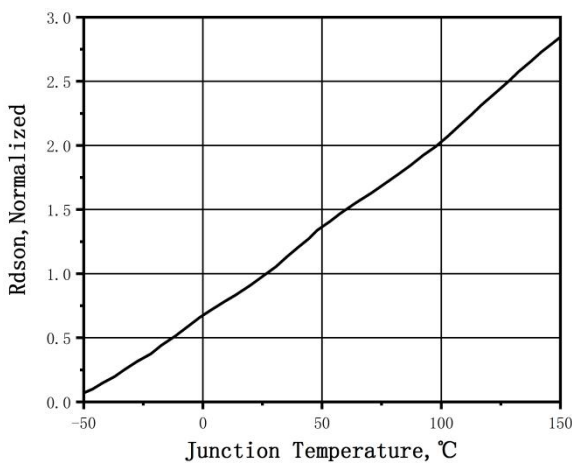


Figure 5. Normalized $R_{DS(on)}$ vs. Temperature

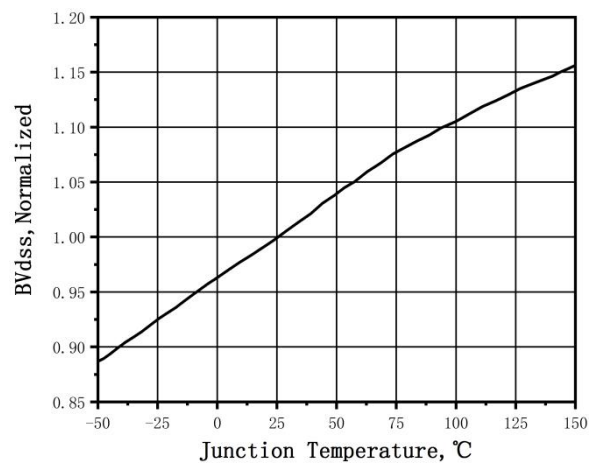


Figure 6. Normalized BV_{DSS} vs. Temperature

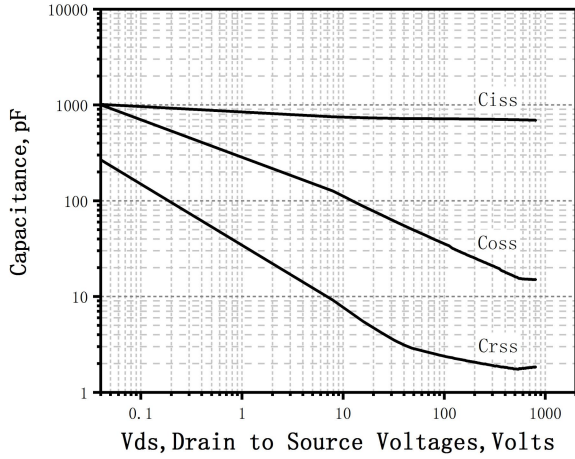


Figure 7. Capacitance Characteristics

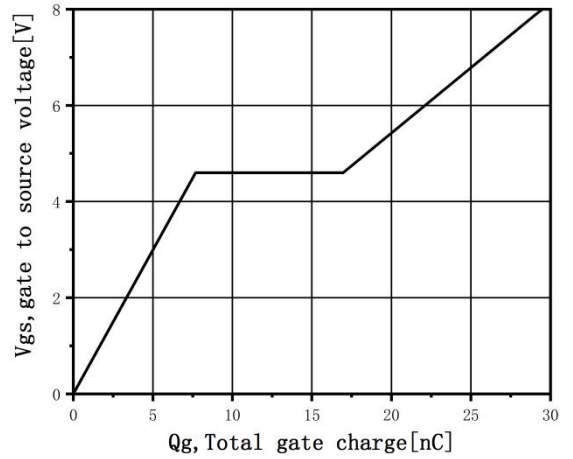


Figure 8. Gate Charge Characteristics

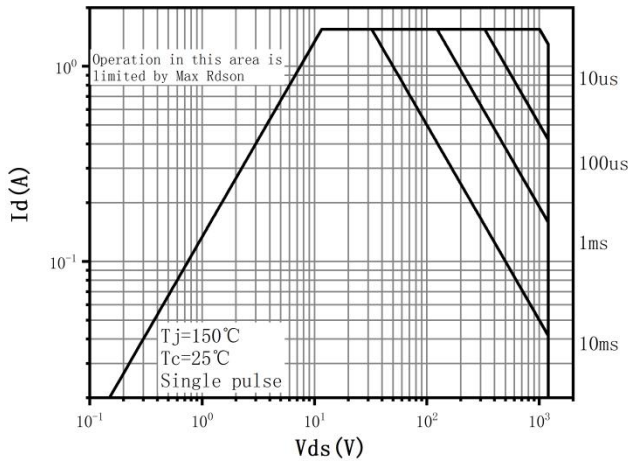


Figure 9. Maximum Safe Operating Area (TO-252)

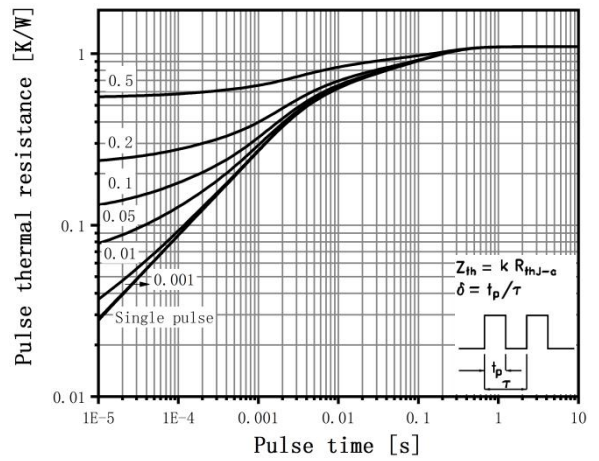
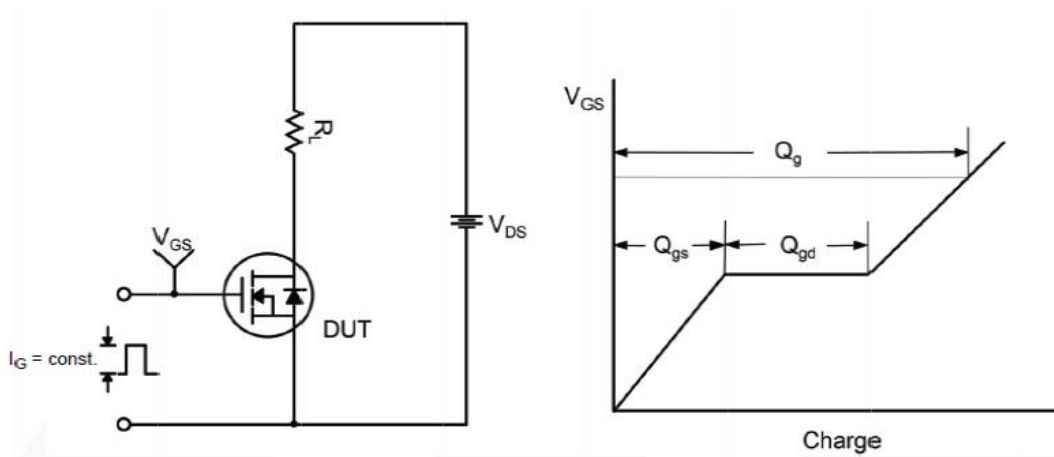
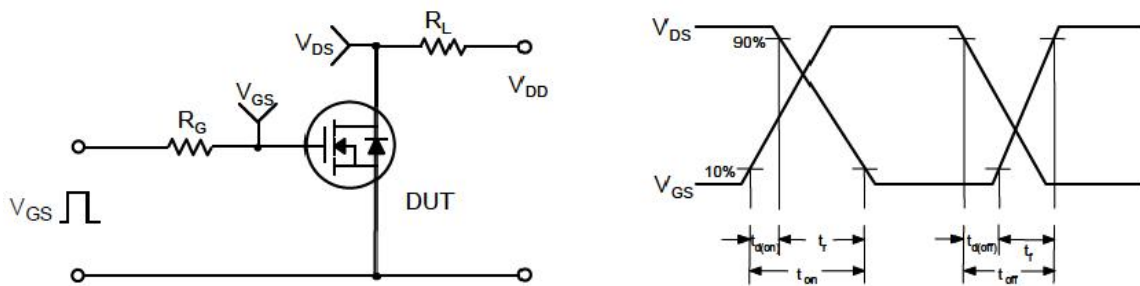


Figure 10. Transient Thermal Response Curve (TO-252)

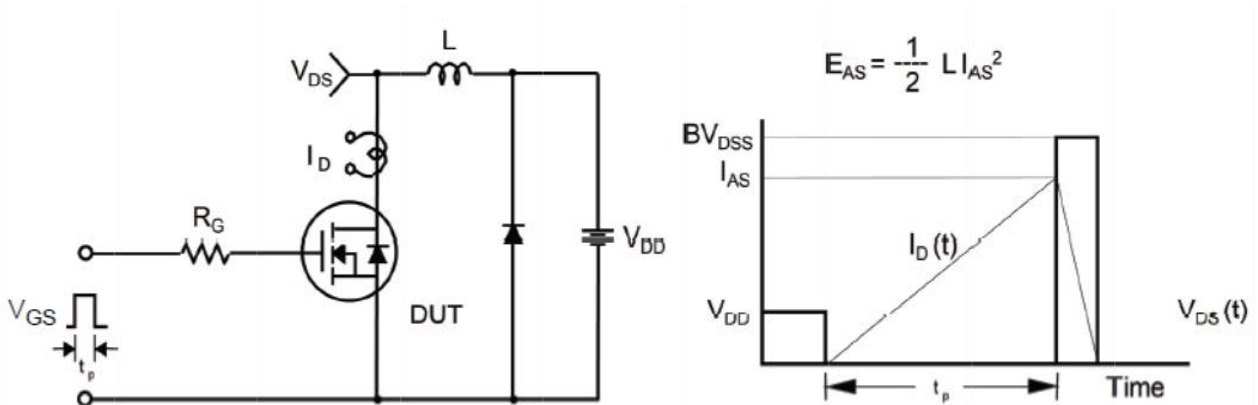
Gate Charge Test Circuit & Waveform



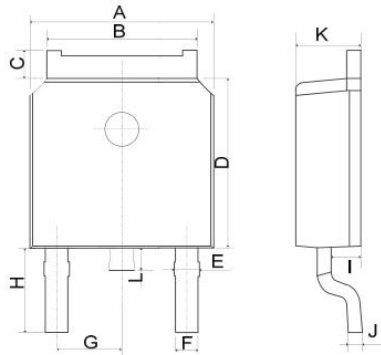
Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms



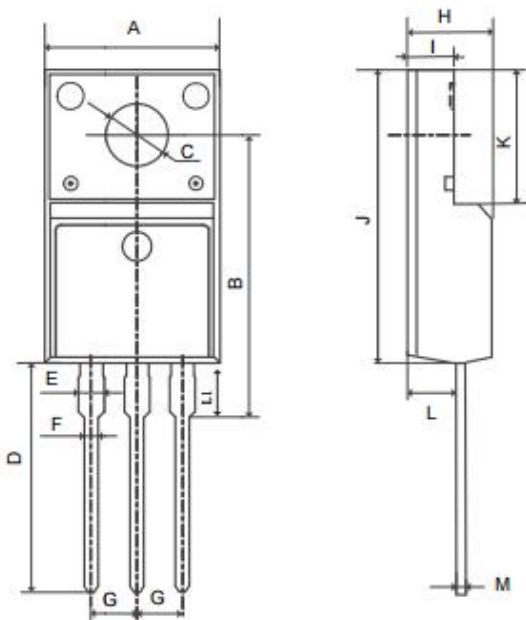
Mechanical Dimensions for TO-252



COMMON DIMENSIONS

SYMBOL	MM	
	MIN	MAX
A	6.40	6.80
B	5.13	5.50
C	0.88	1.28
D	5.90	6.22
E	0.68	1.10
F	0.68	0.91
G	2.29REF	
H	2.90REF	
I	0.85	1.17
J	0.51REF	
K	2.10	2.50
L	0.40	1.00

Mechanical Dimensions for TO-220F



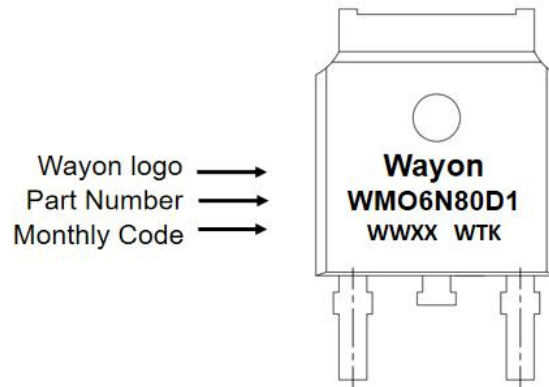
COMMON DIMENSIONS

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

Ordering Information

Part	Package	Marking	Packing method
WMO6N80D1	TO-252	WMO6N80D1	Tape and reel
WML6N80D1	TO-220F	WML6N80D1	Tube

Marking Information



Contact Information

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