

1200V 3A 6.3Ω 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.

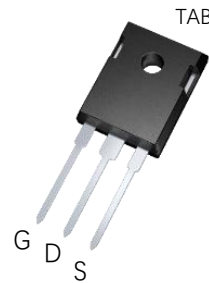
Features

- Typ. $R_{DS(on)}=6.3\Omega@V_{GS}=10V$
- 100% avalanche tested
- Pb-free, Halogen free

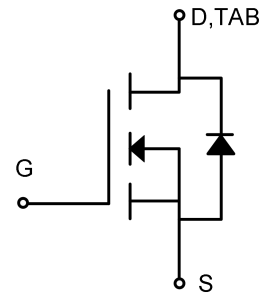
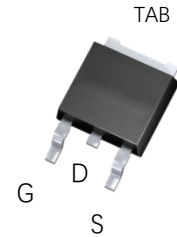
Applications

- SMPS
- Charger
- DC-DC

TO-247



TO-252



Absolute Maximum Ratings (T_c=25°C)

Parameter	Symbol	WMJ3N120D1	WMO3N120D1	Unit
Drain-source voltage	V _{DSS}	1200		V
Gate-source voltage	V _{GS}	±30		V
Continuous drain current	I _D	3		A
Pulsed drain current	I _{DM}	12		A
Avalanche energy, single pulse	E _{AS}	100		mJ
Power dissipation	P _D	156.2	62.5	W
Derate above 25°C		2	2	W/°C
Operating junction temperature	T _j	-55~150		°C
Storage temperature	T _{stg}	-55~150		°C
Continuous diode forward current	I _S	3		A
Diode pulse current	I _{Spulse}	12		A

Thermal Characteristic

Thermal resistance, junction-to-case	R _{θJC}	0.8	2	°C/W
Thermal resistance, junction-to-ambient	R _{θJA}	62.5	62.5	°C/W

Electrical Characteristics of MOSFET

				Min.	Typ.	Max.	
Drain-source break down voltage	BV_{DSS}	$I_D=250\mu A, V_{GS}=0V$	$T_C=25^\circ C$	1200	-	-	V
Gate threshold voltage	$V_{GS(th)}$	$I_D=250\mu A, V_{DS}=V_{GS}$	$T_J=25^\circ C$	2.5	3.7	4	V
Drain-source leakage current	I_{DSS}	$V_{DS}=1200V, V_{GS}=0V$	$T_J=25^\circ C$	-	-	1	μA
		$V_{DS}=960V, V_{GS}=0V$	$T_J=125^\circ C$	-	-	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	$R_{DS(ON)}$	$V_{GS}=10V, I_D=1.5A$	$T_J=25^\circ C$	-	6.3	7.5	Ω
Transconductance	G_{fs}	$V_{DS}=20V, I_D=1.5A$	$T_J=25^\circ C$	-	2.6	-	S

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

				Min.	Typ.	Max.	
Input capacitance	C_{iss}	$f=1MHz, V_{DS}=25V, V_{GS}=0V$		-	875	-	pF
Output capacitance	C_{oss}			-	62.5	-	pF
Reverse transfer capacitance	C_{rss}			-	7.1	-	pF
Gate to source charge	Q_{gs}	$V_{DD}=600V$		-	6.6	-	nC
Gate to drain charge	Q_{gd}	$I_D=3A$		-	7.8	-	nC
Total gate charge	Q_g	$V_{GS}=0$ to 10V		-	22.2	-	nC

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

				Min.	Typ.	Max.	
Turn-on delay time	$t_{d on}$	$V_{DS}=600V, I_D=3A, R_G=4.7\Omega, V_{GS}=10V$		-	11	-	ns
Rise time	t_r			-	10	-	ns
Turn-off delay time	$t_{d off}$			-	25.6	-	ns
Fall time	t_f			-	25.6	-	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}	$I_S=3A, V_{GS}=0V$ $-di/dt=100A/us$		-	1.8	-	μs
Reverse recovery current	I_{rr}			-	8.2	-	A
Recovery charge	Q_{rr}			-	7.4	-	μC

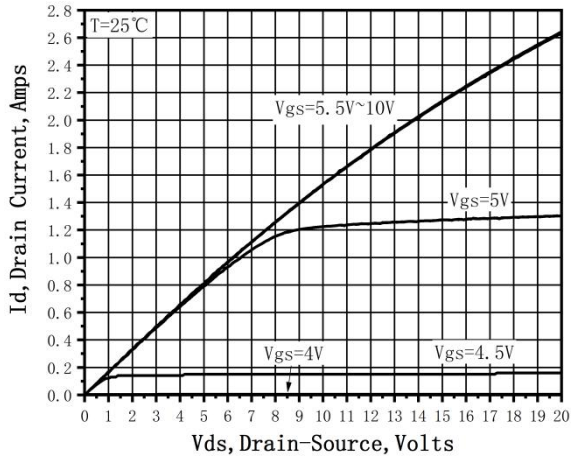


Figure 1. On-Region Characteristics

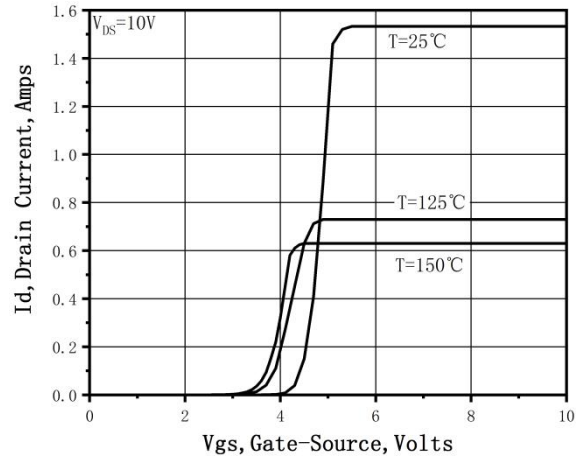


Figure 2. Transfer Characteristics

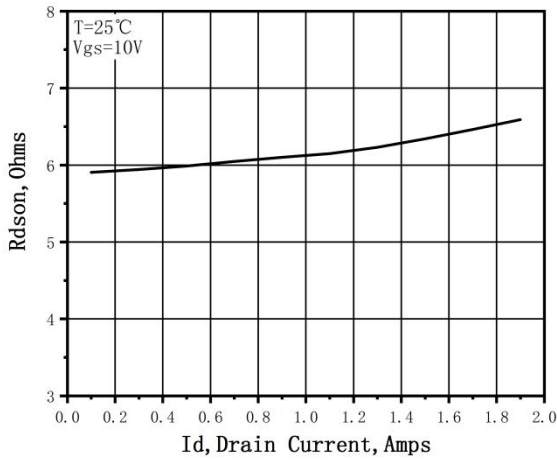


Figure 3. Static Drain-Source On Resistance

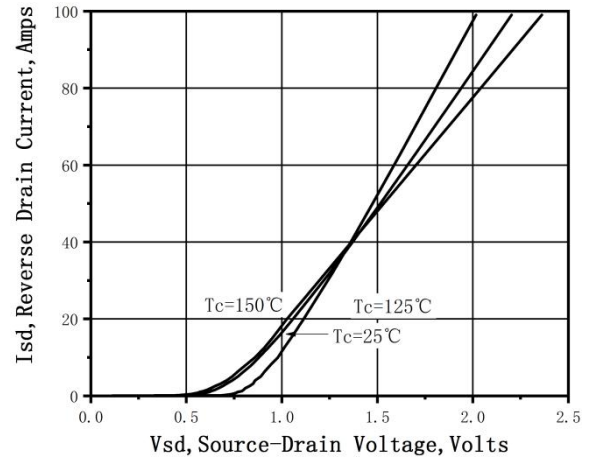


Figure 4. Typical Body Diode Transfer Characteristics

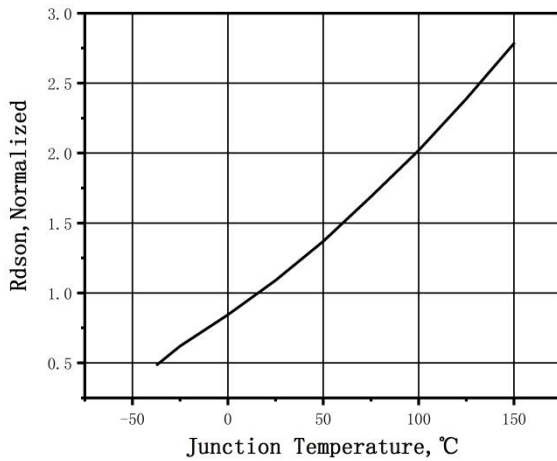


Figure 5. Normalized $R_{DS(on)}$ vs. Temperature

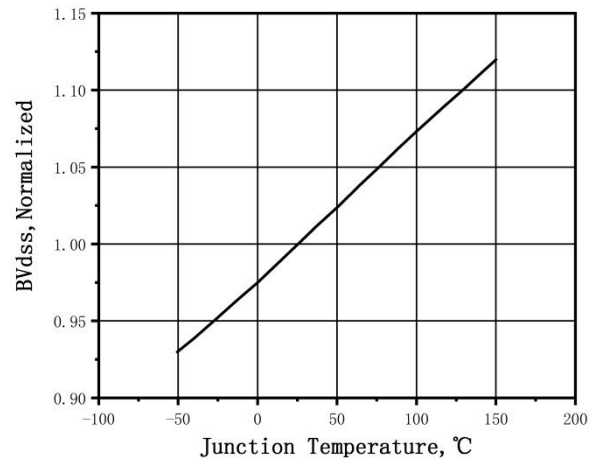


Figure 6. Normalized BV_{DSS} vs. Temperature

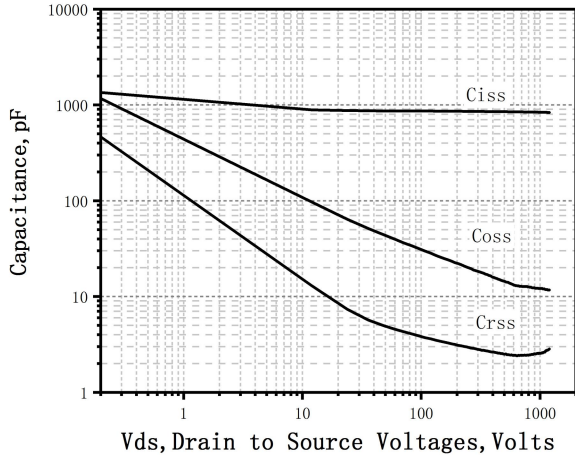


Figure 7. Capacitance Characteristics

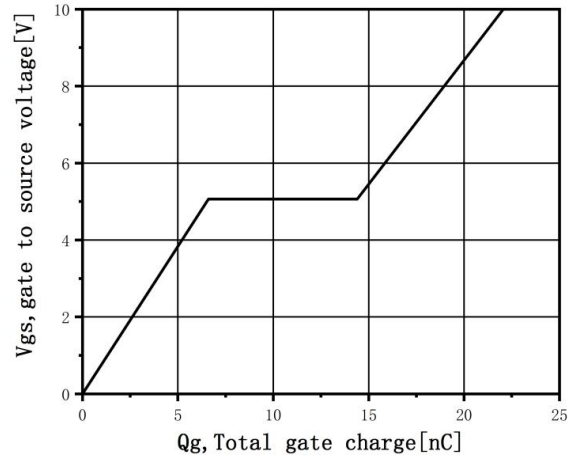


Figure 8. Gate Charge Characteristics

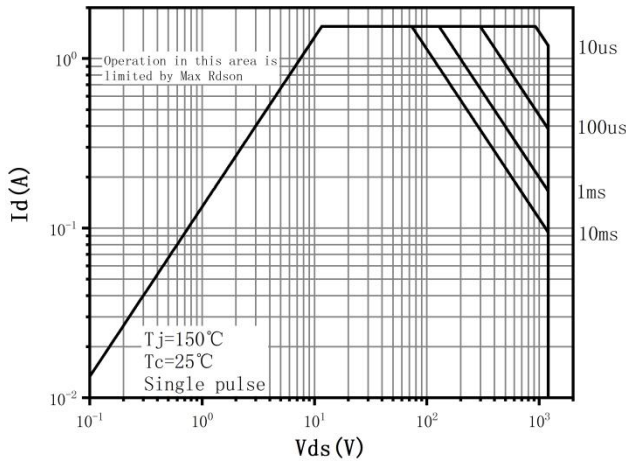


Figure 9. Maximum Safe Operating Area (TO-247)

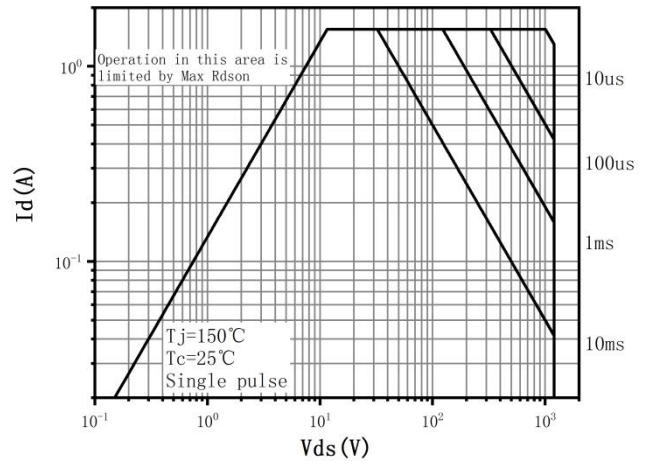


Figure 10. Maximum Safe Operating Area (TO-252)

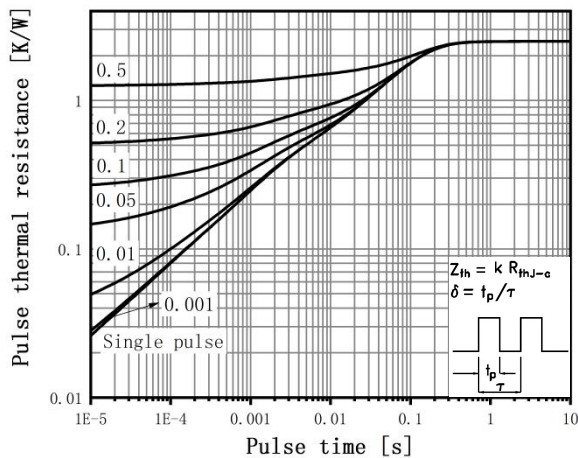


Figure 11. Transient Thermal Response Curve (TO-247)

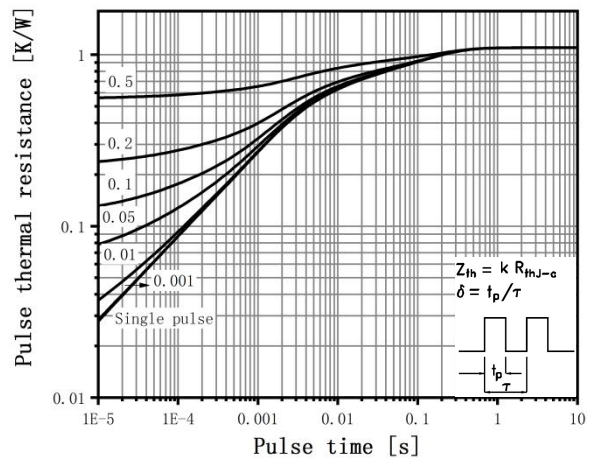
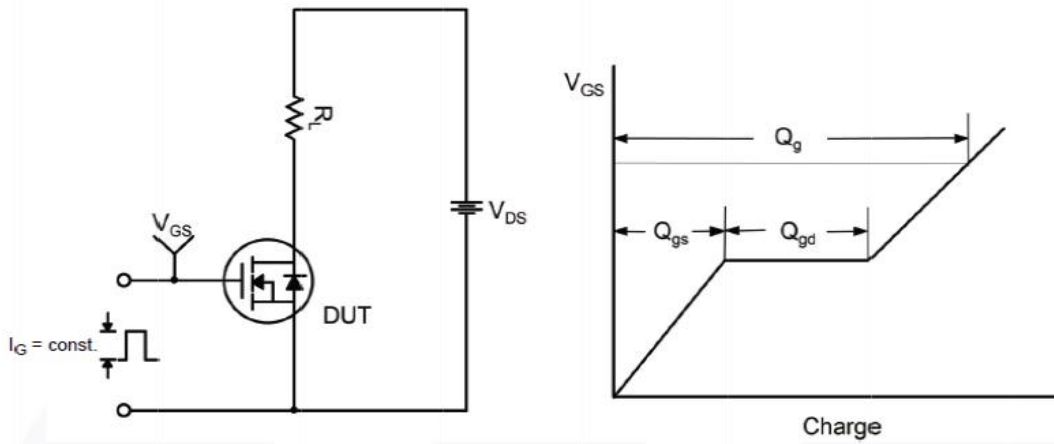
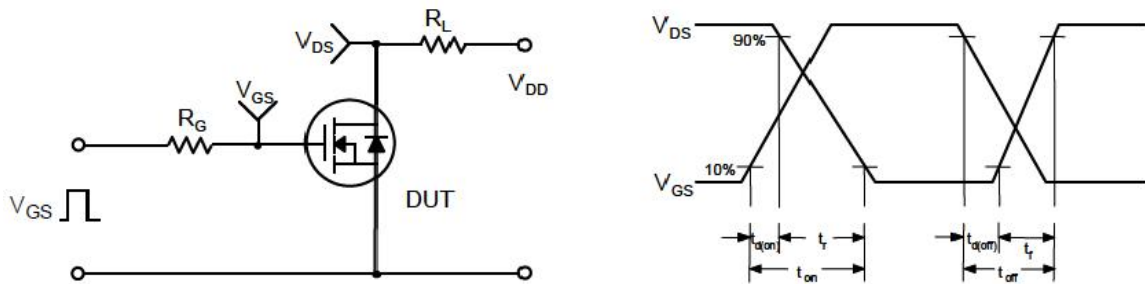


Figure 12. Transient Thermal Response Curve (TO-252)

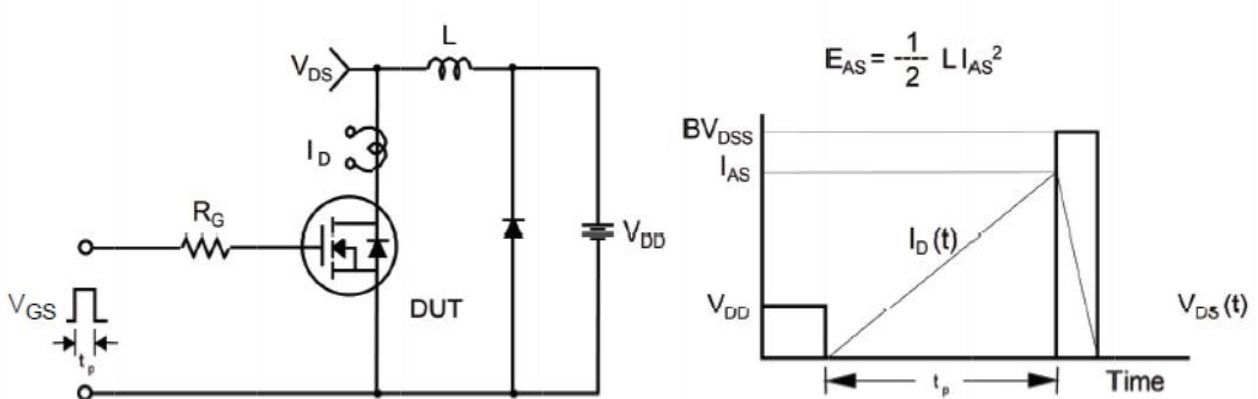
Gate Charge Test Circuit & Waveform



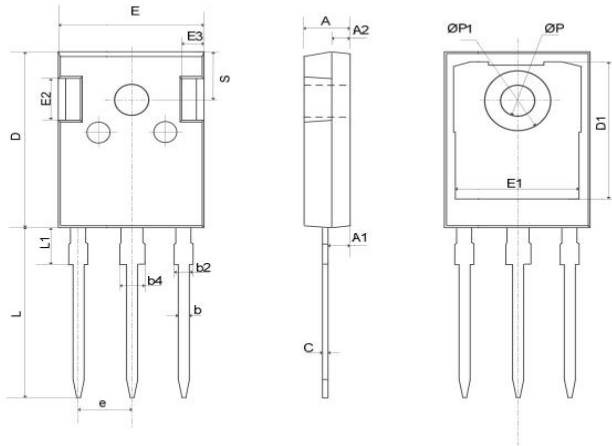
Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms



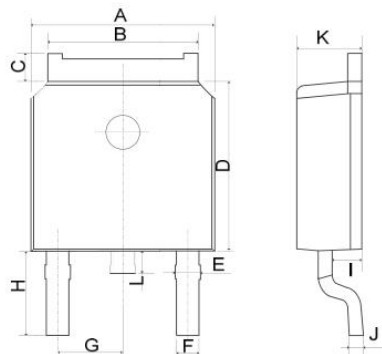
Mechanical Dimensions for TO-247



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	

Mechanical Dimensions for TO-252



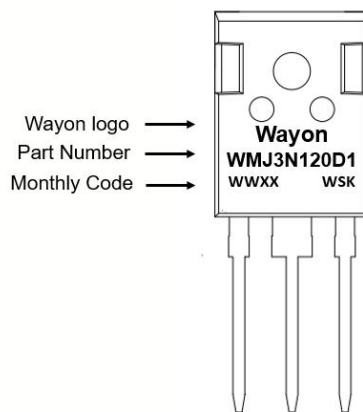
COMMON DIMENSIONS

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

Ordering Information

Part	Package	Marking	Packing method
WMJ3N120D1	TO-247	WMJ3N120D1	Tube
WMO3N120D1	TO-252	WMO3N120D1	Tube

Marking Information




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