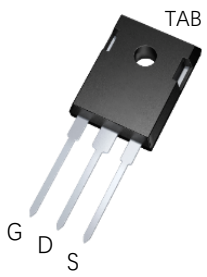
900V 18A 0.65Ω N-ch Power MOSFET

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-247



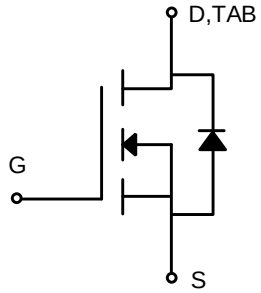
Features

- Typ.$R_{DS(on)}$=0.65Ω@V_{GS}=10V
- 100% avalanche tested
- Pb-free，Halogen free

Applications

- SMPS
- Charger
- DC-DC

RoHS compliant



Absolute Maximum Ratings (Tc=25℃)

Parameter	Symbol	WMJ18N90D1	Unit
Drain-source voltage	V_{DSS}	900	V
Gate-source voltage	V_{GS}	±30	V
Continuous drain current	I_D	18	A
Continuous drain current@Tc=100℃		12	A
Pulsed drain current [1]	I_{DM}	72	A
Avalanche energy, single pulse [2]	E_{AS}	850	mJ
Power dissipation	P_D	595	W
Derate above 25°C		4.7	W/℃
Operating junction temperature	T_j	-55~150	℃
Storage temperature	T_{stg}	-55~150	℃
Continuous diode forward current	I_S	18	A
Diode pulse current	I_{Spulse}	72	A

Thermal Characteristic

Thermal resistance,junction-to-case	$R_{\theta JC}$	0.21	℃/W
Thermal resistance,junction-to-ambient	$R_{\theta JA}$	60	℃/W

Electrical Characteristics of MOSFET

				Min.	Typ.	Max.	
Drain-source breakdown voltage	BV_{DSS}	I_D=250uA, V_{GS}=0V	T_C=25℃	900	-	-	V
Gate threshold voltage	$V_{GS(th)}$	I_D=250uA, V_{DS}=V_{GS}	T_J=25℃	2.5	-	4.5	V
Drain-source leakage current	I_{DSS}	V_{DS}=900V, V_{GS}=0V	T_J=25℃	-	-	1	uA
		V_{DS}=720V, 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 [3]	$R_{DS(ON)}$	V_{GS}=10V, I_D=9A	T_J=25℃	-	0.65	0.78	Ω
Transconductance [3]	G_{fs}	V_{DS}=20V	T_J=25℃	-	9	-	S

Dynamic Characteristics of MOSFET (T_C=25℃)

			Min.	Typ.	Max.	
Input capacitance	C_{iss}	f=1MHz, V_{DS}=25V, V_{GS}=0V	-	3790	-	pF
Output capacitance	C_{oss}		-	255	-	pF
Reverse transfer capacitance	C_{rss}		-	110	-	pF
Gate to source charge	Q_{gs}	V_{DD}=450V	-	24	-	nC
Gate to drain charge	Q_{gd}	I_D=18A	-	24	-	nC
Total gate charge	Q_g	V_{GS}= 0 to10V	-	77	-	nC

Switching Characteristics of MOSFET (T_C=25℃)

			Min.	Typ.	Max.	
Turn-on delay time	$t_{d\ on}$	V_{DS}=450V, I_D=18A, R_G=10Ω, V_{GS}=0 to 10V	-	40	-	ns
Rise time	t_r		-	70	-	ns
Turn-off delay time	$t_{d\ off}$		-	55	-	ns
Fall time	t_f		-	55	-	ns

Characteristics of Body Diode (T_C=25℃)

			Min.	Typ.	Max.	
Forward voltage	V_{SD}	I_{SD}=18A, V_{GS}=0V	-	-	1.4	V
Reverse recovery time	t_{rr}	I_S=18A, V_{GS}=0V di/dt=100A/us	-	820	-	ns
Reverse recovery current	I_{rr}		-	19.5	-	A
Recovery charge	Q_{rr}		-	8	-	uC

Notes:

1. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$ =150°C.
2. The EAS data shows Max. rating . The test condition is V_{DD} =50V, V_{GS} =10V, L=20mH, I_{AS} =9.7A,Tc=25℃.
3. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.

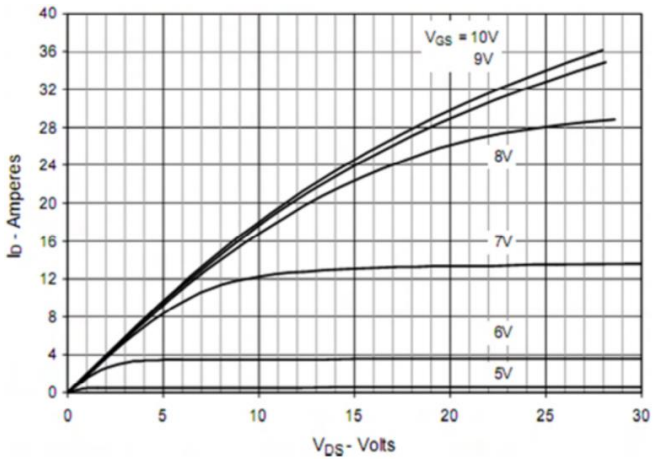


Figure 1.On-Region Characteristics

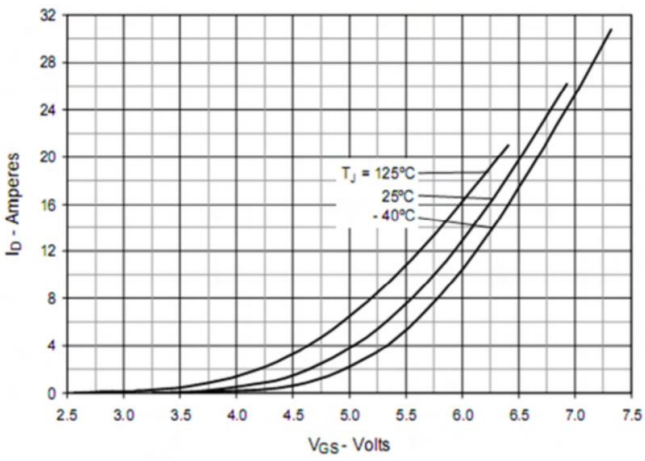


Figure 2. Transfer Characteristics

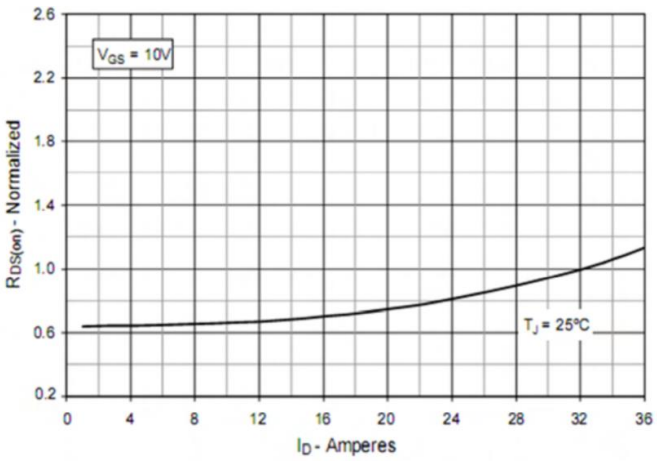


Figure 3.Normalized Static Drain-Source On Resistance

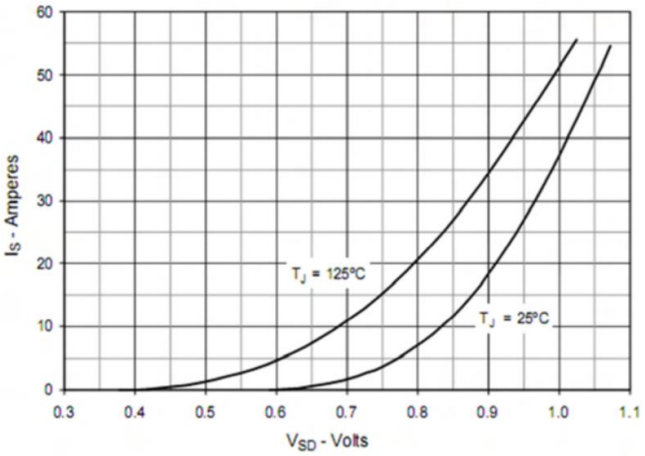


Figure 4. Typical Body Diode Transfer Characteristics

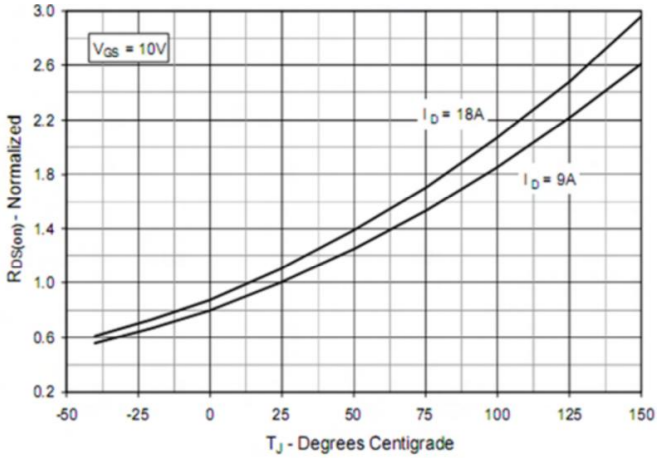


Figure 5. Normalized $R_{DS(on)}$ vs.Temperature

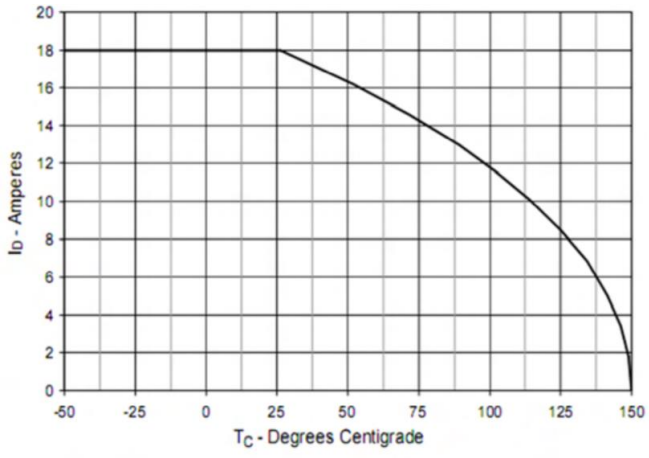


Figure 6. Continuous Drain Current Derating vs. Case Temperature

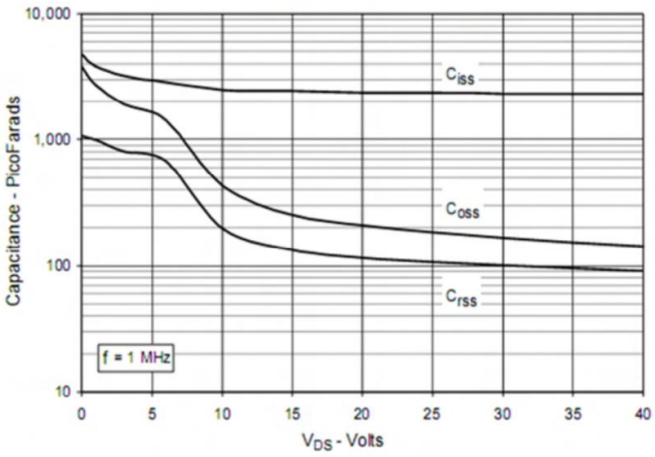


Figure 7. Capacitance Characteristics

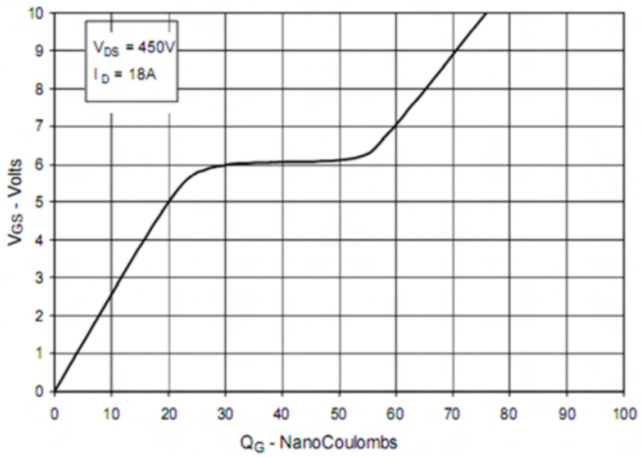


Figure 8. Gate Charge Characteristics

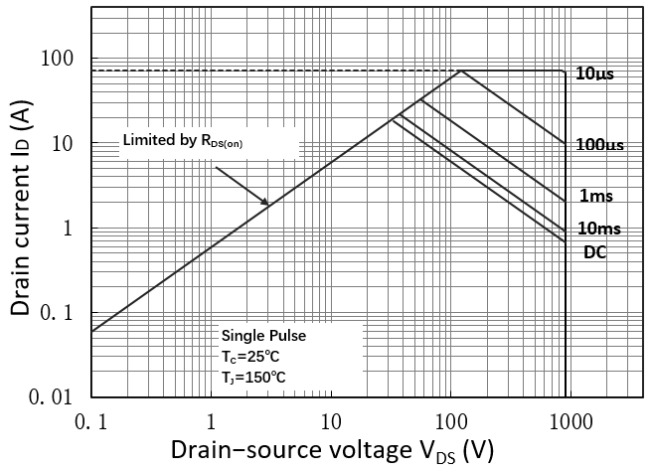


Figure 9. Maximum Safe Operating Area
(TO-247)

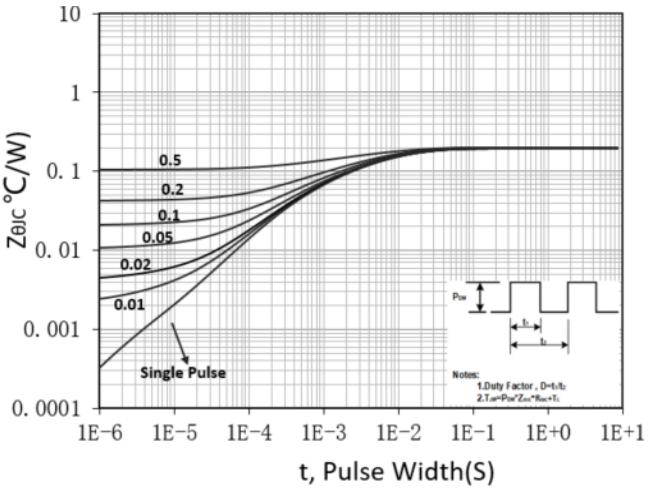
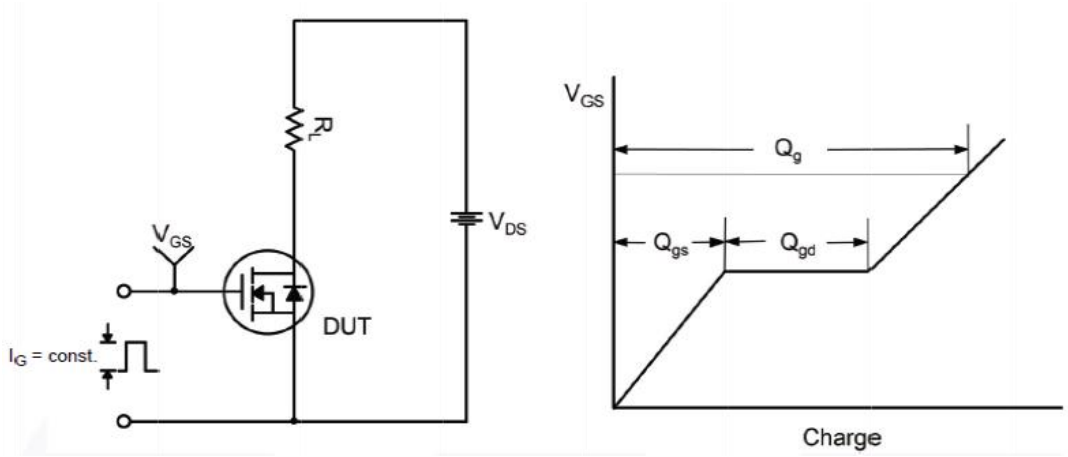
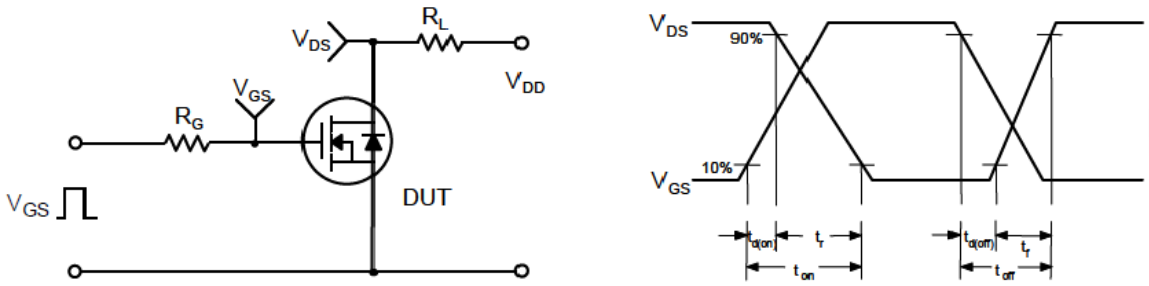


Figure 10. Transient Thermal Response Curve
(TO-247)

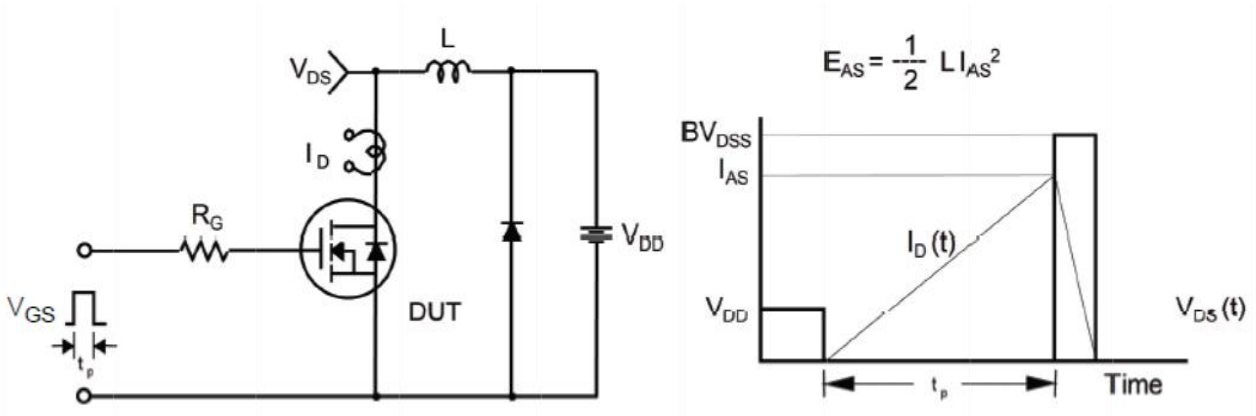
Gate Charge Test Circuit &Waveform



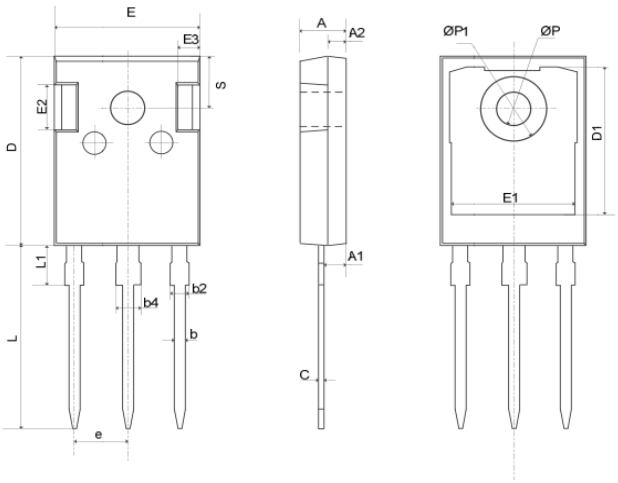
Switching Test Circuit &Waveforms



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	

Ordering Information

Part	Package	Marking	Packing method
WMJ18N90D1	TO-247	WMJ18N90D1	Tube

Contact Information

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