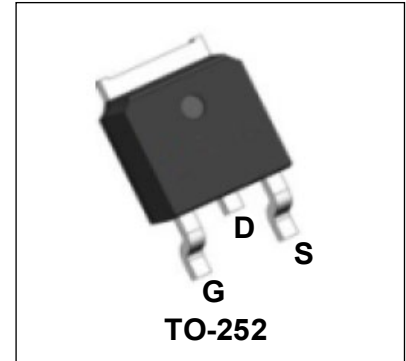


200V 9A 0.35Ω N-ch Power MOSFET

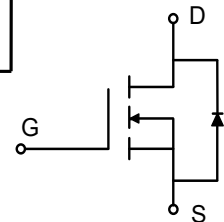
Description

WMO09N20DMH 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

- $V_{DS} = 200V$, $I_D = 9A$
 $R_{DS(on)} < 350m\Omega @ V_{GS} = 10V$
- Green Device Available
- Low Gate Charge
- 100% EAS Guaranteed



Applications

- SMPS
- Charger
- DC/DC Converter

Absolute Maximum Ratings ($T_A = 25^\circ C$, unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	200	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	$T_C = 25^\circ C$	I_D	9	A
	$T_C = 100^\circ C$		5.8	
Pulsed Drain Current ¹		I_{DM}	36	A
Single Pulse Avalanche Energy ²		EAS	80	mJ
Total Power Dissipation	$T_C = 25^\circ C$	P_D	80.6	W
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	$^\circ C$

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction-to-Ambient ³	$R_{\theta JA}$	65	$^\circ C/W$
Thermal Resistance from Junction-to-Case	$R_{\theta JC}$	1.55	$^\circ C/W$

Electrical Characteristics (T_J = 25°C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit	
Static Characteristics							
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = 250μA	200	-	-	V	
Gate-body Leakage current	I _{GSS}	V _{DS} = 0V, V _{GS} = ±20V	-	-	±100	nA	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 200V, V _{GS} = 0V	T _J =25°C	-	-	1	μA
			T _J =100°C	-	-	100	
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	2.7	3.2	3.7	V	
Drain-Source on-Resistance ⁴	R _{DS(on)}	V _{GS} = 10V, I _D = 5A	-	270	350	mΩ	
Forward Transconductance ⁴	g _{fs}	V _{DS} =10V, I _D =5A	-	7.9	-	S	
Dynamic Characteristics⁵							
Input Capacitance	C _{iss}	V _{DS} = 100V, V _{GS} = 0V, f = 1MHz	-	550	-	pF	
Output Capacitance	C _{oss}		-	43	-		
Reverse Transfer Capacitance	C _{rss}		-	20	-		
Gate Resistance	R _g	f = 1MHz	-	0.65	-	Ω	
Switching Characteristics⁵							
Total Gate Charge	Q _g	V _{GS} = 10V, V _{DS} = 100V, I _D =5A	-	19.1	-	nC	
Gate-Source Charge	Q _{gs}		-	4	-		
Gate-Drain Charge	Q _{gd}		-	7.2	-		
Turn-on Delay Time	t _{d(on)}	V _{GS} = 10V, V _{DD} = 100V, R _G = 3Ω, I _D = 5A	-	8	-	ns	
Rise Time	t _r		-	3.3	-		
Turn-off Delay Time	t _{d(off)}		-	17.8	-		
Fall Time	t _f		-	3.6	-		
Body Diode Reverse Recovery Time	t _{rr}	I _F = 5A, dI/dt=100A/μs	-	138	-	ns	
Body Diode Reverse Recovery Charge	Q _{rr}		-	665	-	nC	
Drain-Source Body Diode Characteristics							
Diode Forward Voltage ⁴	V _{SD}	I _S = 5A, V _{GS} = 0V	-	-	1.2	V	
Continuous Source Current	I _S	T _C =25°C	-	-	9	A	

Notes:

1. Repetitive rating, pulse width limited by junction temperature T_{J(MAX)}=150°C.
2. The test condition is V_{DD}=50V, V_{GS}=10V, L=0.4mH, I_{AS}=20A.
3. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper, The value in any given application depends on the user's specific board design.
4. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
5. This value is guaranteed by design hence it is not included in the production test.

Typical Characteristics

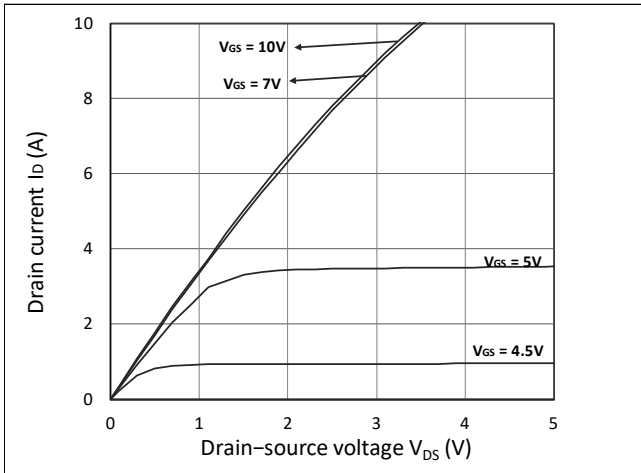


Figure 1. Output Characteristics

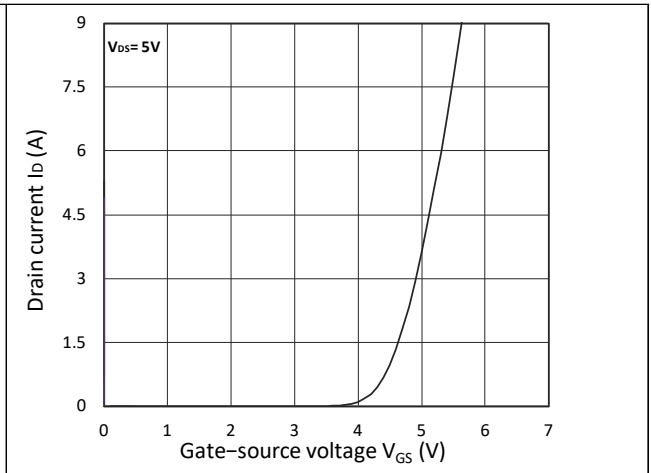


Figure 2. Transfer Characteristics

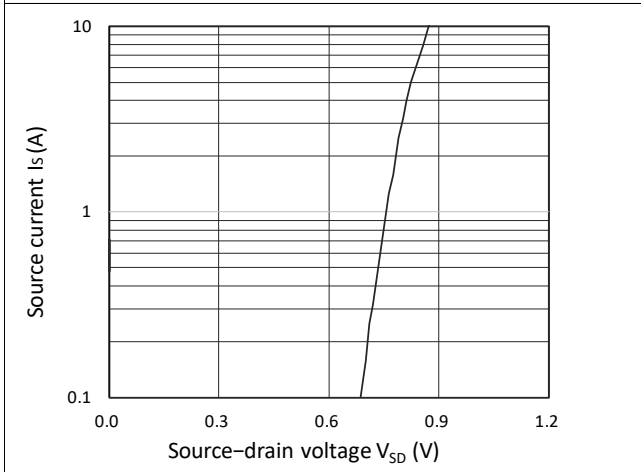


Figure 3. Forward Characteristics of Reverse

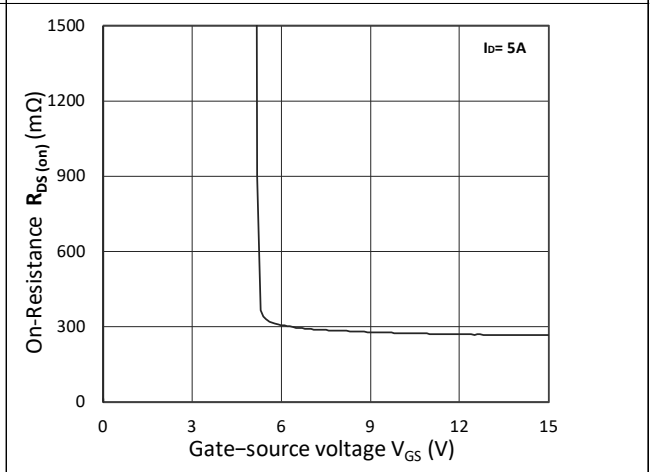


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

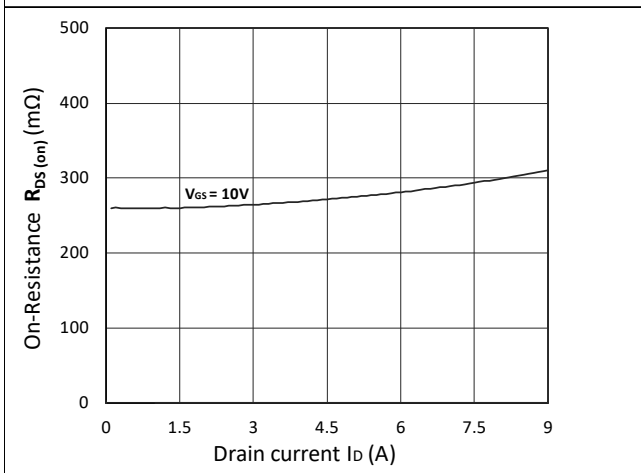


Figure 5. $R_{DS(ON)}$ vs. I_D

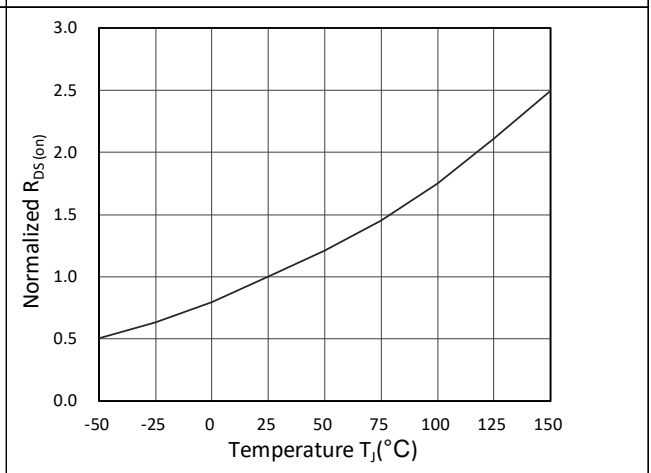


Figure 6. Normalized $R_{DS(ON)}$ vs. Temperature

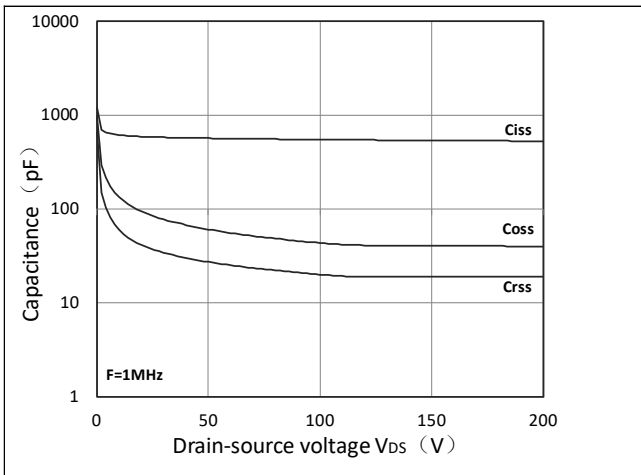


Figure 7. Capacitance Characteristics

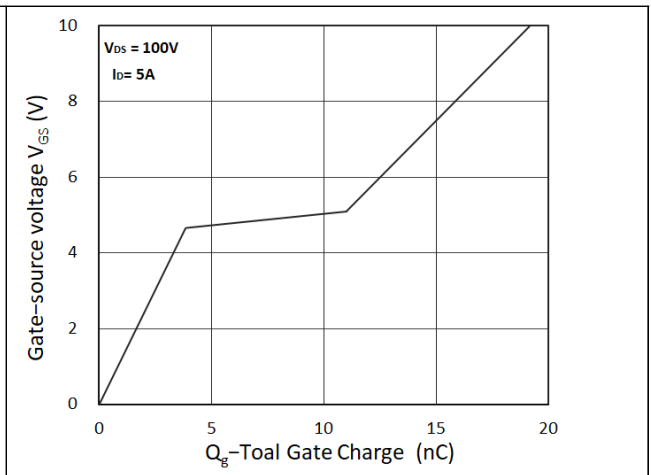


Figure 8. Gate Charge Characteristics

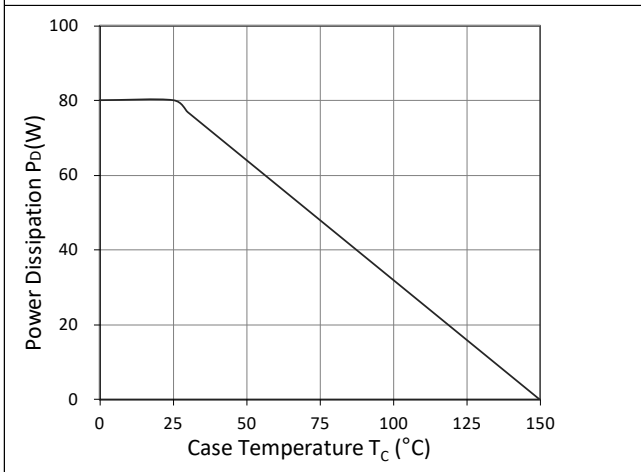


Figure 9. Power Dissipation

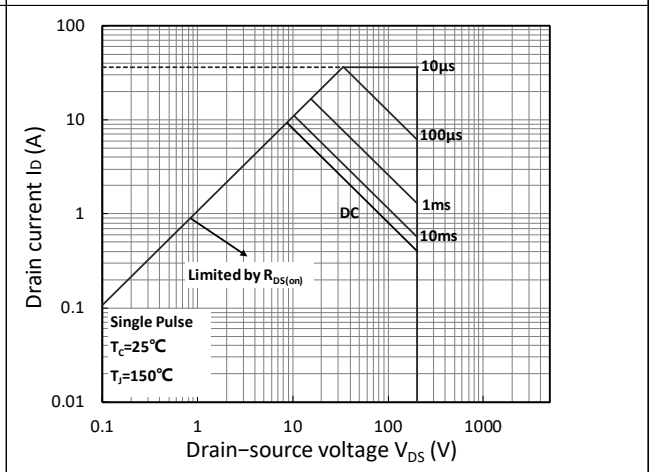


Figure 10. Safe Operating Area

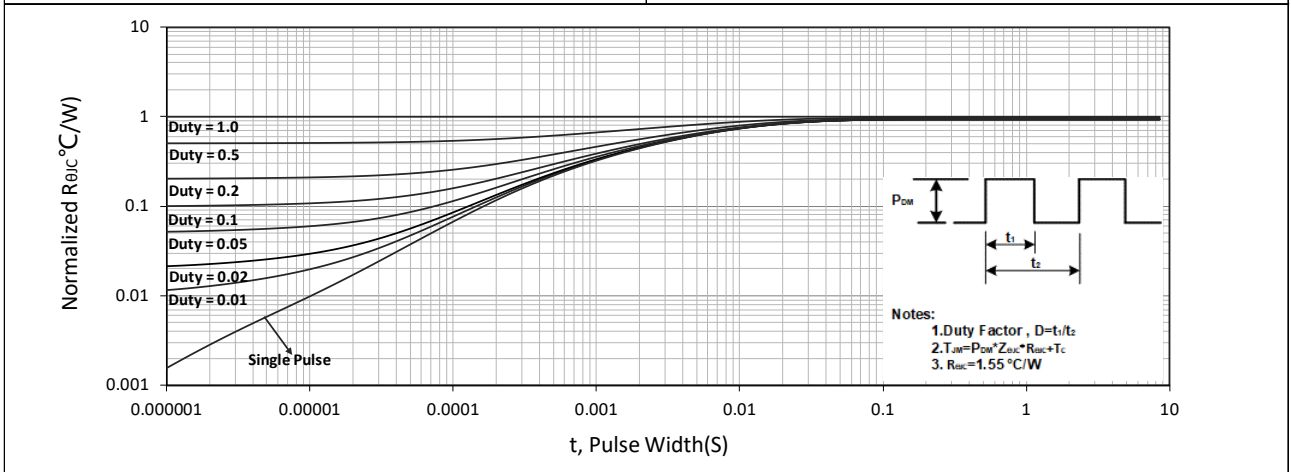


Figure 11. Normalized Maximum Transient Thermal Impedance

Test Circuit

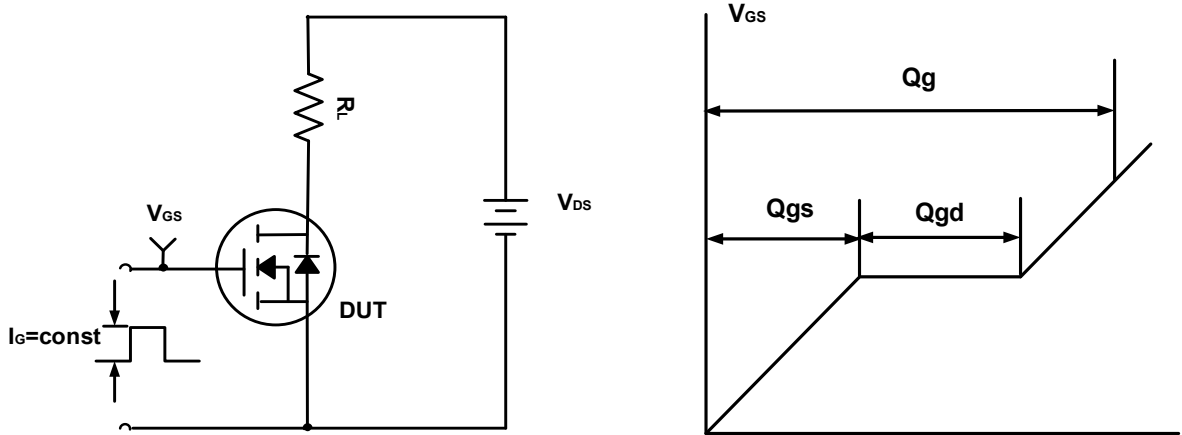


Figure A. Gate Charge Test Circuit & Waveforms

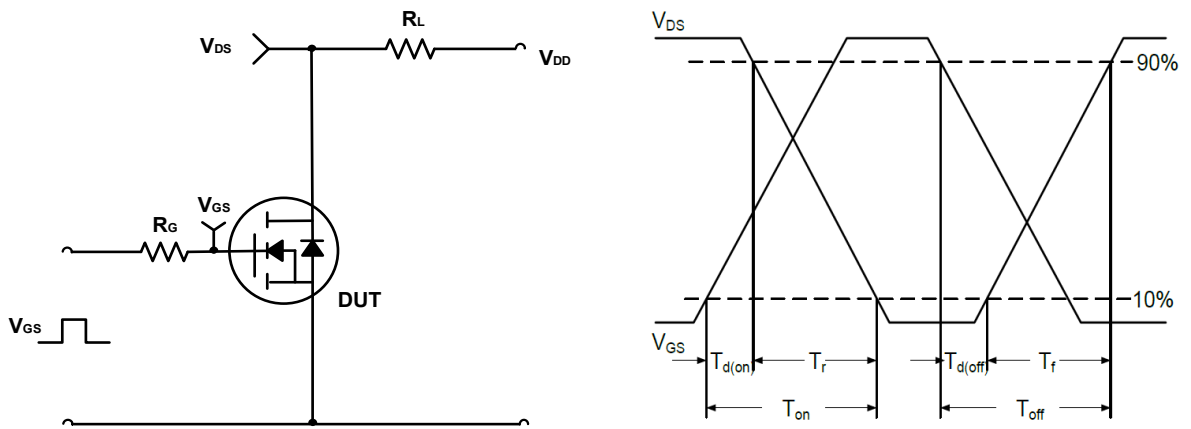


Figure B. Switching Test Circuit & Waveforms

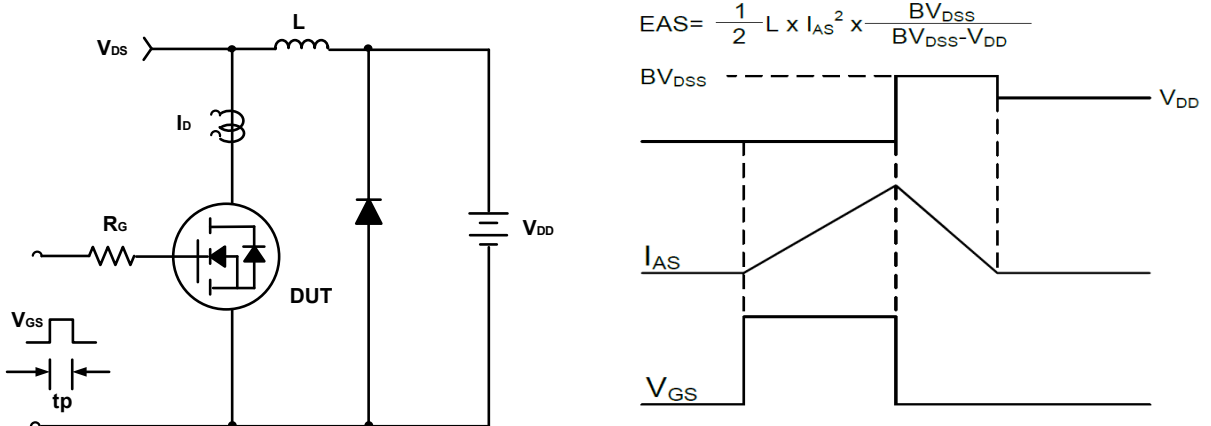
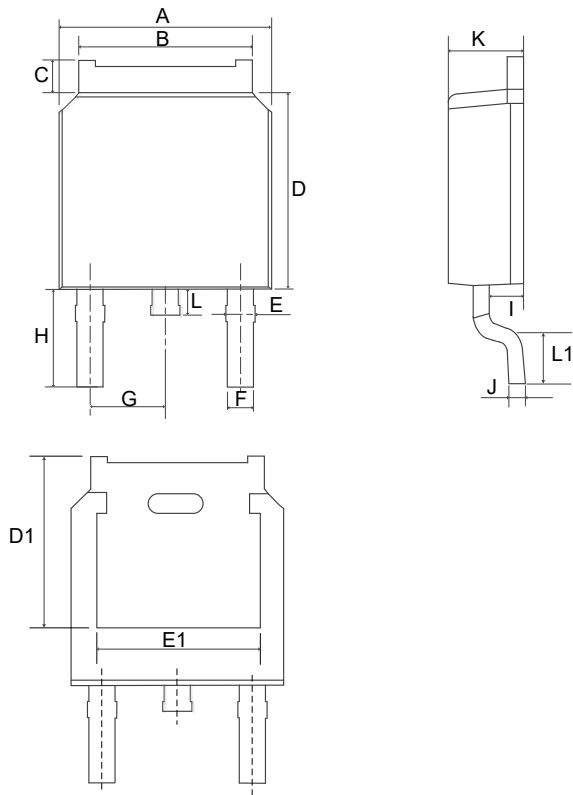


Figure C. Unclamped Inductive Switching Circuit & Waveforms

Mechanical Dimensions for TO-252

COMMON DIMENSIONS

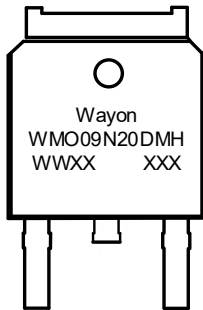


SYMBOL	MM	
	MIN	MAX
A	6.40	6.80
B	5.13	5.50
C	0.88	1.28
D	5.90	6.22
D1	5.35REF	
E	0.68	1.10
E1	4.83REF	
F	0.68	0.91
G	2.29REF	
H	2.90REF	
I	0.85	1.17
J	0.51REF	
K	2.10	2.50
L	0.40	1.00
L1	1.50REF	

Ordering Information

Part	Package	Marking	Packing method
WMO09N20DMH	TO-252	WMO09N20DMH	Tape and Reel

Marking Information



WMO09N20DMH = Device code

WWXX XXX = Date code


Contact Information

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WAYON website: <http://www.way-on.com>

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