

Dual N-Channel Enhancement Mode MOSFET

Description

WM02DN560Q uses advanced power trench technology that has been especially tailored to minimize the on-state resistance. This device is suitable for un-directional or bidirectional load switch, facilitated by its common-drain configuration.

$V_{(BR)DSS}(V)$	$I_D(A)$	$R_{DS(on)TYP}(m\Omega)$
20	56	4.2 @ $V_{GS}=4.5V$
		4.3 @ $V_{GS}=3.9V$
		4.7 @ $V_{GS}=3.1V$
		5.0 @ $V_{GS}=2.5V$

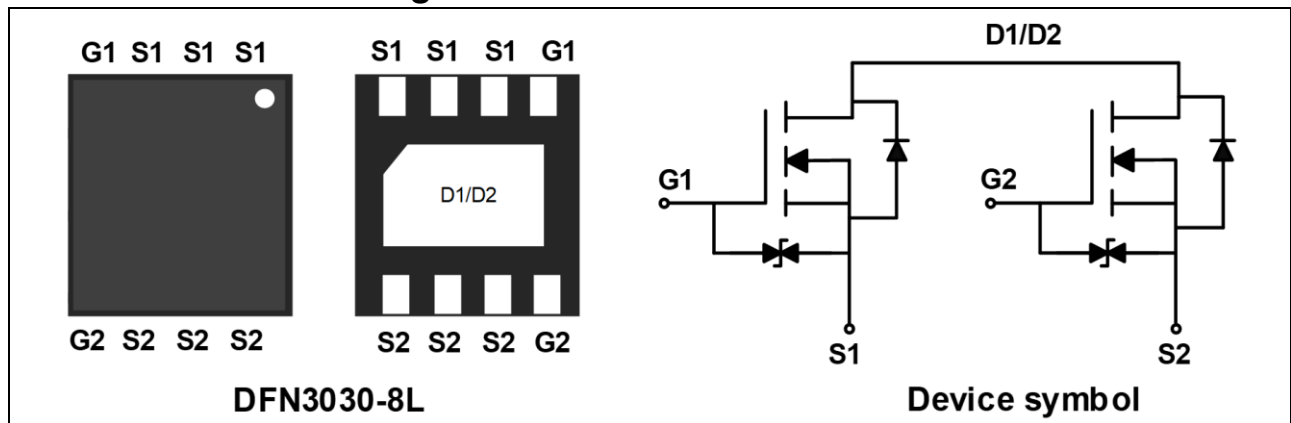
Features

- Super high dense cell for low $R_{DS(ON)}$
- RoHS Compliant and Halogen-Free
- ESD protected: Class 2

Applications

- Battery protection
- Load switch

Schematic & PIN Configuration



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

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	20	V
Gate-Source Voltage		V_{GS}	± 12	V
Continuous Drain Current	$T_C=25^\circ C$	I_D	56	A
	$T_C=100^\circ C$		35.6	
	$T_A=25^\circ C$		20	
	$T_A=70^\circ C$		15.8	
Pulsed Drain Current ¹		I_{DM}	100	A
Single Pulse Avalanche Energy ²		EAS	64.8	mJ
Total Power Dissipation	$T_C=25^\circ C$	P_D	31	W
	$T_A=25^\circ C$		3.6	
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	$R_{\theta JA}$	35	$^\circ C/W$
Thermal Resistance from Junction-to-Case	$R_{\theta JC}$	4	$^\circ C/W$

Electrical Characteristics ($T_J = 25^{\circ}\text{C}$, 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	20	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 20V, V _{GS} = 0V	-	-	1	μA
Gate-body Leakage Current	I _{GSS}	V _{DS} = 0V, V _{GS} = ±8V	-	-	±10	μA
Gate-Threshold Voltage ³	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	0.45	-	1.0	V
Drain-Source on-Resistance ⁴	R _{DS(on)}	V _{GS} = 4.5V, I _D = 3A	3.5	4.2	5.4	mΩ
		V _{GS} = 3.9V, I _D = 3A	3.7	4.3	6	
		V _{GS} = 3.1V, I _D = 3A	3.8	4.7	6.2	
		V _{GS} = 2.5V, I _D = 3A	4	5	6.4	
Dynamic Characteristics ⁵						
Input Capacitance	C _{iss}	V _{DS} = 10V, V _{GS} =0V, f =1MHz	-	2270	-	pF
Output Capacitance	C _{oss}		-	340	-	
Reverse Transfer Capacitance	C _{rss}		-	320	-	
Switching Characteristics ⁵						
Total Gate Charge	Q _g	V _{GS} =3.9V, V _{DS} = 10V, I _D = 3A	-	25	-	
Gate-Source Charge	Q _{gs}		-	3.5	-	
Gate-Drain Charge	Q _{gd}		-	7.6	-	
Turn-on Delay Time	t _{d(on)}	V _{GS} =4.5V, V _{DD} = 16V, R _G = 6Ω, I _D = 3A	-	7.9	-	ns
Rise Time	t _r		-	15.9	-	
Turn-off Delay Time	t _{d(off)}		-	115	-	
Fall Time	t _f		-	59	-	
Drain-Source Diode Characteristics						
Diode Forward Voltage ⁴	V _{SD}	I _S = 1A, V _{GS} = 0V	-	-	1.2	V

Notes:

1. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)} = 150^{\circ}\text{C}$.
2. The EAS data shows Max. rating . The test condition is $V_{DD} = 25V, V_{GS} = 10V, L = 0.1mH, I_{AS} = 36A$.
3. The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper, The value in any given application depends on the user's specific board design.
4. The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
5. This value is guaranteed by design hence it is not included in the production test.

Typical Characteristics

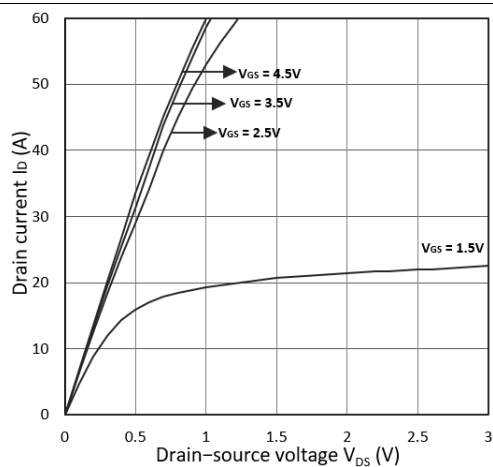


Figure 1. Output Characteristics

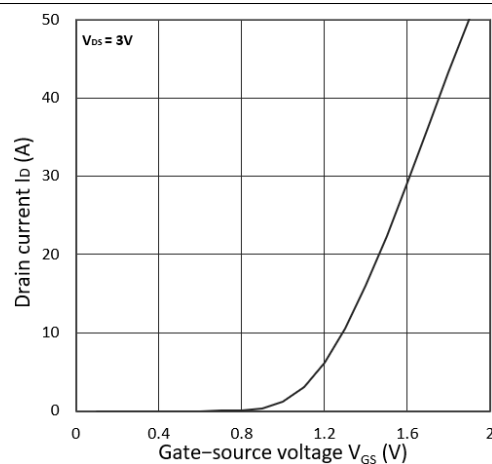


Figure 2. Transfer Characteristics

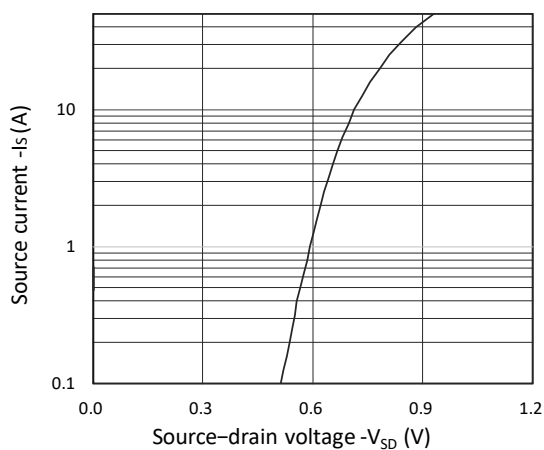


Figure 3. Forward Characteristics of Reverse

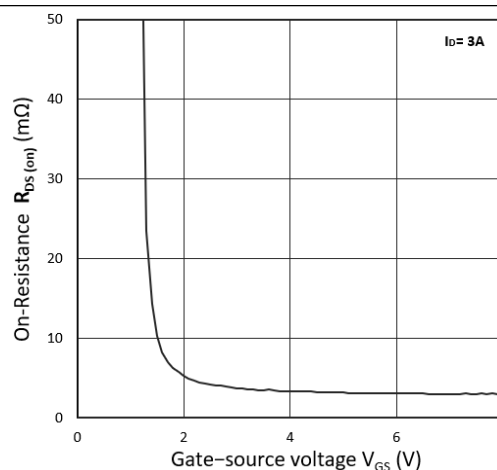
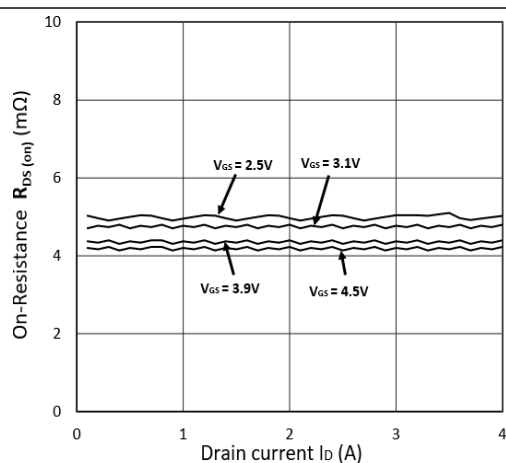
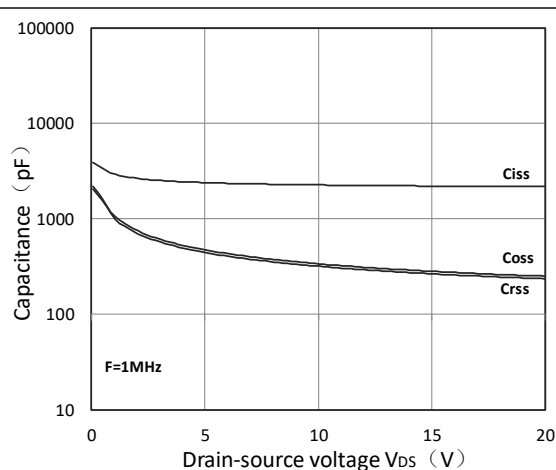
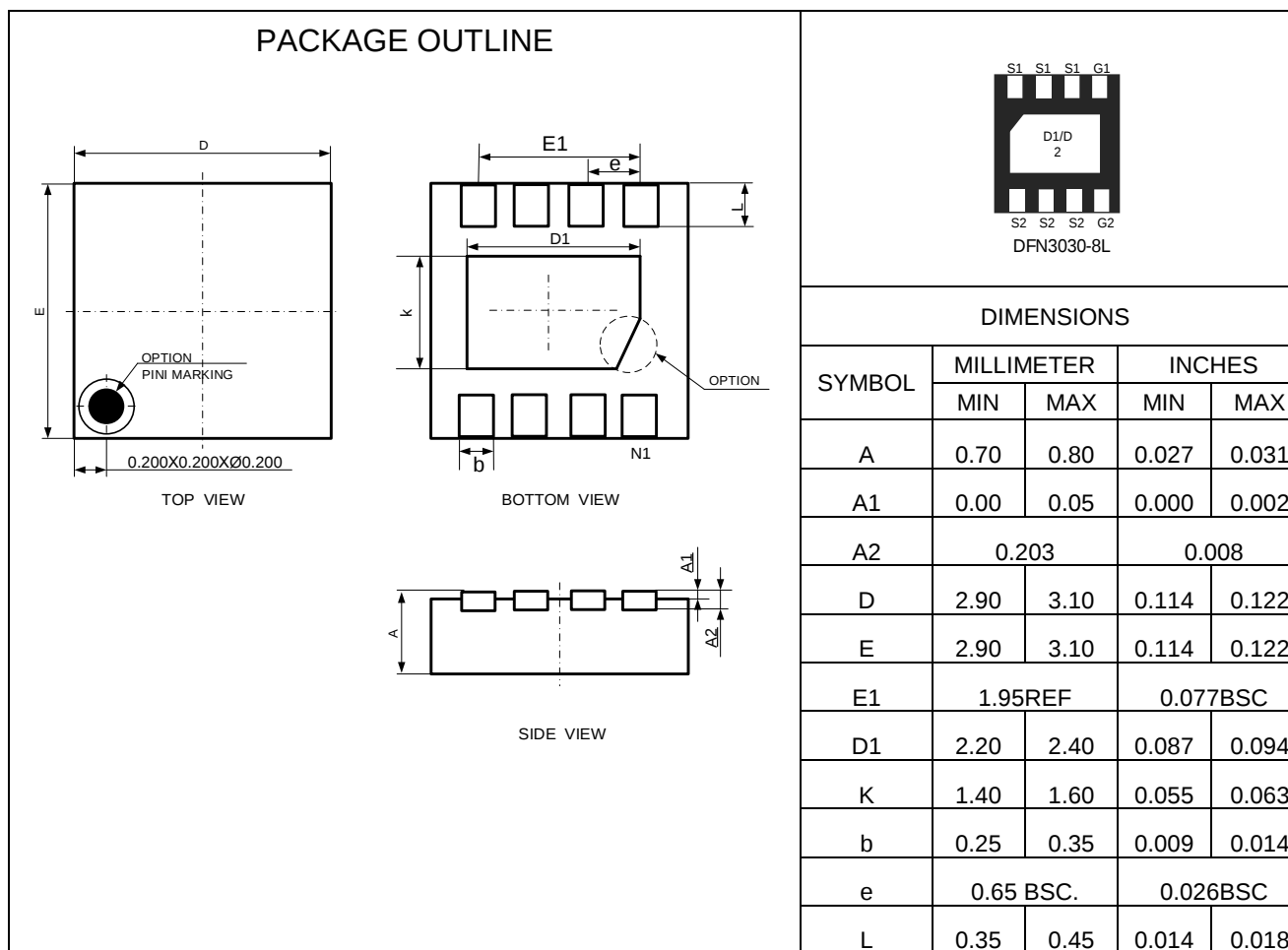
Figure 4. $R_{DS(ON)}$ vs. V_{GS} Figure 5. $R_{DS(ON)}$ vs. I_D 

Figure 6. Capacitance Characteristics

Outline Drawing –DFN3030-8L



Marking Codes

Part Number	WM02DN560Q
Marking Code	Q56N02 WWXX XXX ● Q56N02 = Device code WWXX XXX= Date code

Package Information

Qty: 3k/Reel

CONTACT INFORMATION

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For additional information, please contact your local Sales Representative.

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Specifications are subject to change without notice.

The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time. Users should verify actual device performance in their specific applications.