

## Dual N-Channel Enhancement Mode MOSFET

### Description

WM02DN110CS 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	12	6.2 @ $V_{GS}=4.5V$
		6.4 @ $V_{GS}=4.0V$
		6.7 @ $V_{GS}=3.7V$
		7.1 @ $V_{GS}=3.1V$
		8.0 @ $V_{GS}=2.5V$

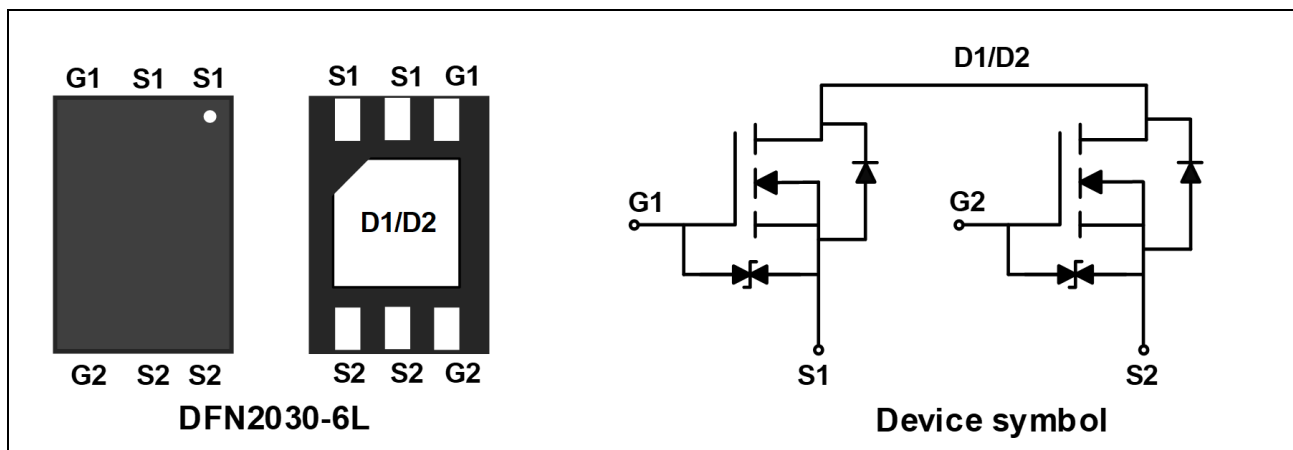
### Features

- 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	$V_{GS}$	$\pm 12$	V
Continuous Drain Current	$I_D$	12	A
		9.4	A
Pulsed Drain Current <sup>1</sup>	$I_{DM}$	48	A
Single Pulse Avalanche Energy <sup>2</sup>	$E_{AS}$	51.2	mJ
Total Power Dissipation	$P_D$	1.56	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 <sup>3</sup>	$R_{\theta JA}$	80	$^{\circ}C/W$

**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 <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA	20	-	-	V
Zero Gate Voltage Drain Current		I <sub>DSS</sub>	V <sub>DS</sub> = 20V, V <sub>GS</sub> = 0V			1	μA
Gate-body Leakage current		I <sub>GSS</sub>	V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±8V	-	-	±10	μA
Gate-Threshold Voltage		V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	0.4	0.65	1.0	V
Drain-Source on-Resistance <sup>4</sup>		R <sub>DS(on)</sub>	V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 5.5A	4.5	6.2	7.2	mΩ
			V <sub>GS</sub> = 4.0V, I <sub>D</sub> = 5.5A	4.8	6.4	7.5	
			V <sub>GS</sub> = 3.7V, I <sub>D</sub> = 5.5A	5.0	6.7	8.2	
			V <sub>GS</sub> = 3.1V, I <sub>D</sub> = 5.5A	5.5	7.1	9.2	
			V <sub>GS</sub> = 2.5 V, I <sub>D</sub> = 5.5A	6.2	8.0	10.5	
Forward Transconductance <sup>4</sup>		g <sub>fs</sub>	V <sub>DS</sub> = 5V, I <sub>D</sub> = 5.5A	-	41	-	S
Dynamic Characteristics <sup>5</sup>							
Input Capacitance		C <sub>iss</sub>	V <sub>DS</sub> = 10V, V <sub>GS</sub> =0V, f =1MHz	-	1720	-	pF
Output Capacitance		C <sub>oss</sub>		-	185	-	
Reverse Transfer Capacitance		C <sub>rss</sub>		-	141	-	
Switching Characteristics <sup>5</sup>							
Total Gate Charge		Q <sub>g</sub>	V <sub>GS</sub> =4.5V, V <sub>DS</sub> = 16V, I <sub>D</sub> = 5.5A	-	15	-	nC
Gate-Source Charge		Q <sub>gs</sub>		-	2.2	-	
Gate-Drain Charge		Q <sub>gd</sub>		-	5.7	-	
Turn-on Delay Time		t <sub>d(on)</sub>	V <sub>GS</sub> =4.5V, V <sub>DD</sub> = 16V, R <sub>G</sub> = 3Ω, I <sub>D</sub> = 5.5A	-	3	-	ns
Rise Time		t <sub>r</sub>		-	6.5	-	
Turn-off Delay Time		t <sub>d(off)</sub>		-	42	-	
Fall Time		t <sub>f</sub>		-	93	-	
Drain-Source Diode Characteristics							
Diode Forward Voltage <sup>4</sup>		V <sub>SD</sub>	I <sub>S</sub> = 1A, V <sub>GS</sub> = 0V	-	-	1.2	V
Continuous Source Current	T <sub>A</sub> =25°C	I <sub>S</sub>	-	-	-	12	A

**Notes:**

1. Repetitive rating, pulse width limited by junction temperature  $T_{J(MAX)} = 150^{\circ}\text{C}$ .
2. The test condition is  $V_{DD} = 25V, V_{GS} = 10V, L = 0.1mH, I_{AS} = 32A$ .
3. The data tested by surface mounted on a 1 inch<sup>2</sup> 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

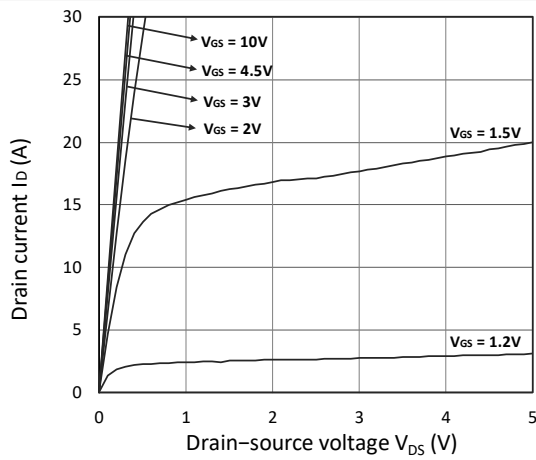


Figure 1. Output Characteristics

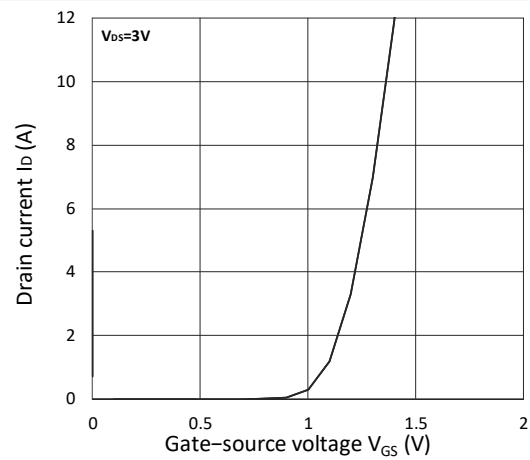


Figure 2. Transfer Characteristics

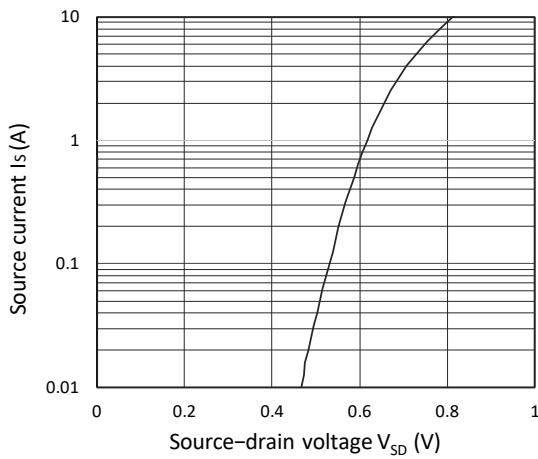
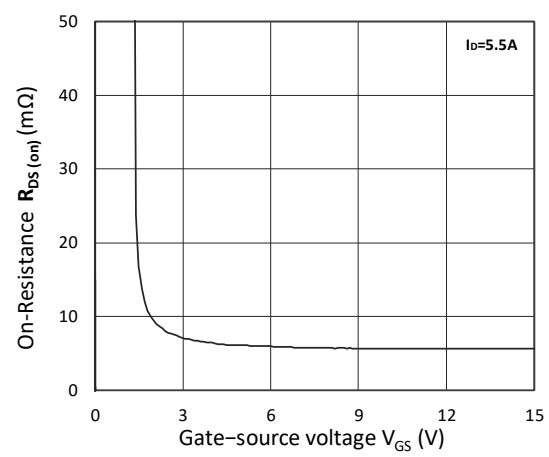
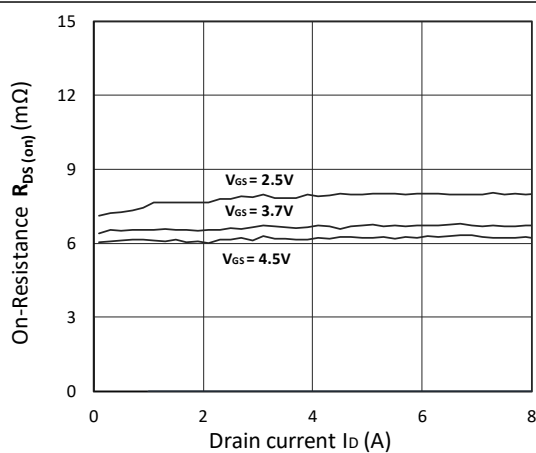
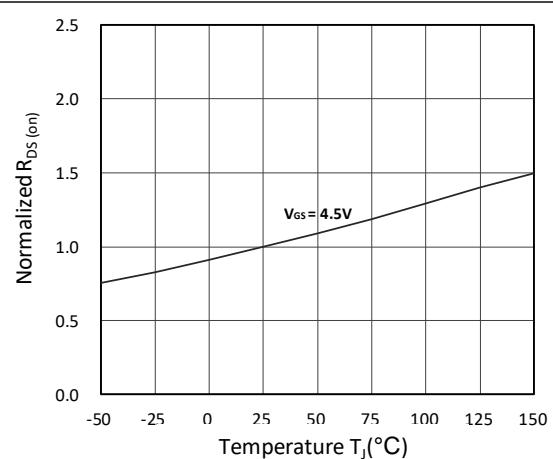


Figure 3. Forward Characteristics of Reverse

Figure 4.  $R_{DS(on)}$  vs.  $V_{GS}$ Figure 5.  $R_{DS(on)}$  vs.  $I_D$ Figure 6. Normalized  $R_{DS(on)}$  vs. Temperature

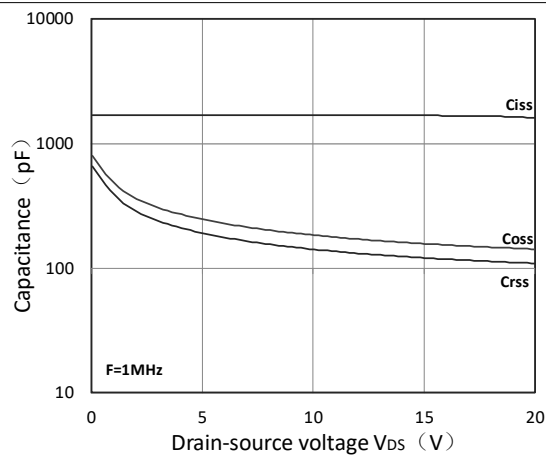


Figure 7. Capacitance Characteristics

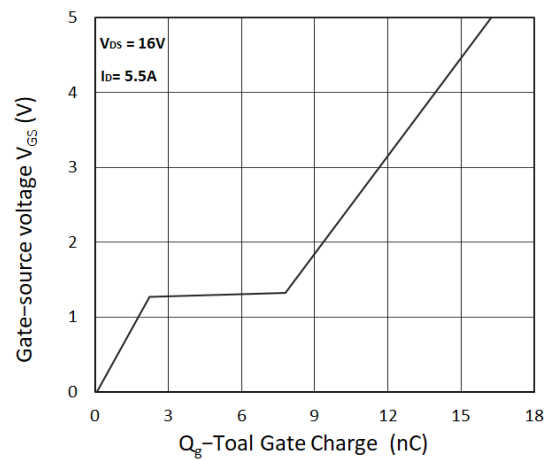
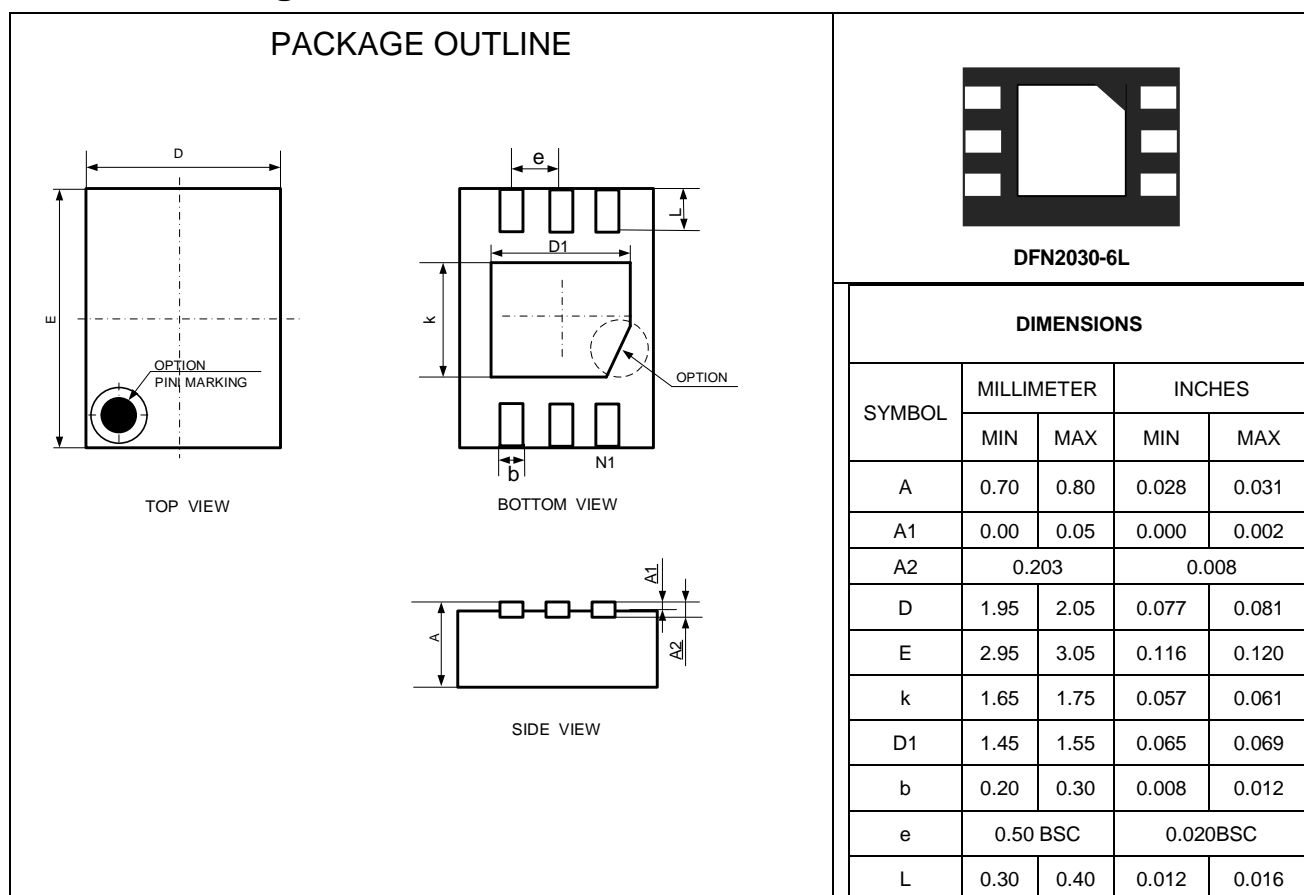


Figure 8. Gate Charge Characteristics

## Outline Drawing –DFN2030-6L



## Marking Codes

Part Number	WM02DN110CS
Marking Code	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> <p>● C11N02S XXXX XXX</p> </div> <p>C11N02S = Device Code XXXX XXX= Date Code</p>

## Package Information

Qty: 3k/Reel

## CONTACT INFORMATION

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For additional information, please contact your local Sales Representative.

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## Product Specification Statement

1. The product specification aims to provide users with a reference regarding various product parameters, performance, and usage. It presents certain aspects of the product's performance in graphical form and is intended solely for users to select product and make product comparisons, enabling users to better understand and evaluate the characteristics and advantages of the product. It does not constitute any commitment, warranty, or guarantee.
2. The product parameters described in the product specification are numerical values, characteristics, and functions obtained through actual testing or theoretical calculations of the product in an independent or ideal state. Due to the complexity of product applications and variations in test conditions and equipment, there may be slight fluctuations in parameter test values. WAYON shall not guarantee that the actual performance of the product when installed in the customer's system or equipment will be entirely consistent with the product specification, especially concerning dynamic parameters. It is recommended that users consult with professionals for product selection and system design. Users should also thoroughly validate and assess whether the actual parameters and performance when installed in their respective systems or equipment meet their requirements or expectations. Additionally, users should exercise caution in verifying product compatibility issues, and WAYON assumes no responsibility for the application of the product.
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