

### General Description

The MDWC0152ERH uses advanced Magnachip's MOSFET Technology, which provides high performance in on-state resistance and excellent reliability. Excellent low  $R_{SS(ON)}$ , low gate charge operation and operation for Battery Application.

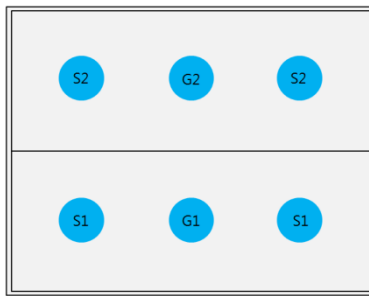
### Features

- $V_{SS} = 12V$
- Source-Source ON Resistance;
  - $R_{SS(ON)}$  typ. 4.0mΩ @  $V_{GS} = 4.5V$
  - $R_{SS(ON)}$  typ. 4.3mΩ @  $V_{GS} = 3.8V$
  - $R_{SS(ON)}$  typ. 4.8mΩ @  $V_{GS} = 3.1V$
  - $R_{SS(ON)}$  typ. 5.9mΩ @  $V_{GS} = 2.5V$

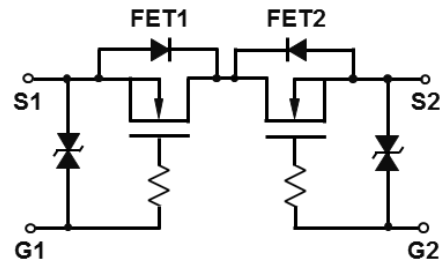
### Applications

- Portable Battery Protection

### Bottom View



2.14mm\*1.67mm WLCSP



### Absolute Maximum Ratings

Characteristics		Symbol	Rating	Units
Source-Source Voltage		$V_{SSS}$	12	V
Gate-Source Voltage		$V_{GSS}$	±8	V
Source Current	DC <sup>1</sup>	$I_S$	15	A
	Pulse	$I_{SP}$	60	A
Total Power Dissipation		$P_D$	1.85	W
Channel Temperature		$T_{ch}$	150	°C
Junction and Storage Temperature Range		$T_J, T_{stg}$	-55~150	°C

### Thermal Characteristics

Characteristics	Symbol	Rating	Unit
Thermal Resistance	$R_{\theta JA}$	67.4	°C/W

## Ordering Information

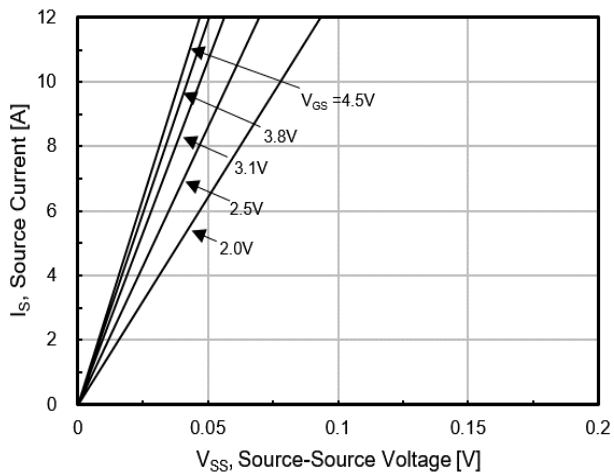
Part Number	Temp. Range	Package	Packing	RoHS Status
MDWC0152ERH	-55~150°C	WLCSP	Tape and Reel	Halogen Free

## Electrical Characteristics (T<sub>A</sub> =25°C unless otherwise noted)

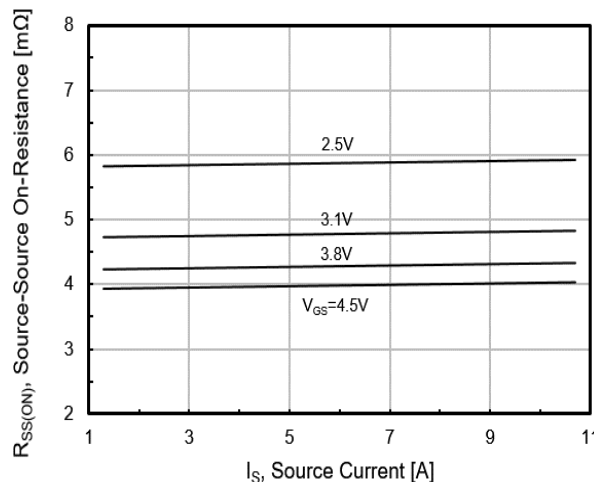
Characteristics	Symbol	Test Condition	Min	Typ	Max	Units
<b>Static Characteristics</b>						
Source-Source Breakdown Voltage	BV <sub>SSS</sub>	I <sub>S</sub> = 1mA, V <sub>GS</sub> = 0V	12	-	-	V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>SS</sub> = V <sub>GS</sub> , I <sub>S</sub> = 0.84mA	-	0.9	1.4	
Cut-Off Current	I <sub>SSS</sub>	V <sub>SS</sub> = 12V, V <sub>GS</sub> = 0V	-	-	1.0	μA
Gate Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±8V, V <sub>SS</sub> = 0V	-	-	10	μA
Source-Source Resistance	R <sub>SS(ON)</sub>	V <sub>GS</sub> = 4.5V, I <sub>S</sub> = 4.0A	-	4.0	5.1	mΩ
		V <sub>GS</sub> = 3.8V, I <sub>S</sub> = 4.0A	-	4.3	5.5	
		V <sub>GS</sub> = 3.1V, I <sub>S</sub> = 4.0A	-	4.8	6.8	
		V <sub>GS</sub> = 2.5V, I <sub>S</sub> = 4.0A	-	5.9	10	
<b>Dynamic Characteristics</b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DD</sub> = 10V, I <sub>S</sub> = 4.0A, V <sub>GS</sub> = 4V	-	32.4	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	7.5	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	12.6	-	
Input Capacitance	C <sub>iss</sub>	V <sub>SS</sub> = 10V, V <sub>GS</sub> = 0V, f = 1 MHz	-	2,023	-	pF
Reverse Transfer Capacitance	C <sub>rss</sub>		-	553	-	
Output Capacitance	C <sub>oss</sub>		-	482	-	
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>GS</sub> = 4V, V <sub>DD</sub> = 10V, I <sub>S</sub> = 4.0A, R <sub>GEN</sub> = 3Ω	-	0.2	-	μS
Rise Time	t <sub>r</sub>		-	1.6	-	
Turn-Off Delay Time	t <sub>d(off)</sub>		-	2.7	-	
Fall Time	t <sub>f</sub>		-	9.8	-	
<b>Drain-Source Body Diode Characteristics</b>						
Source-Source Diode Forward Voltage	V <sub>F(S-S)</sub>	I <sub>F</sub> = 4.0A, V <sub>GS</sub> = 0V	-	0.8	1.2	V

Note \*1. Mounted on PCB Board (25.4mm x 25.4mm)

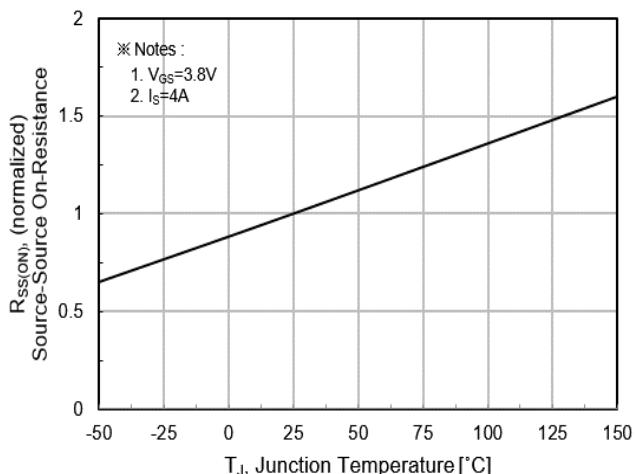
### Characteristic Graph



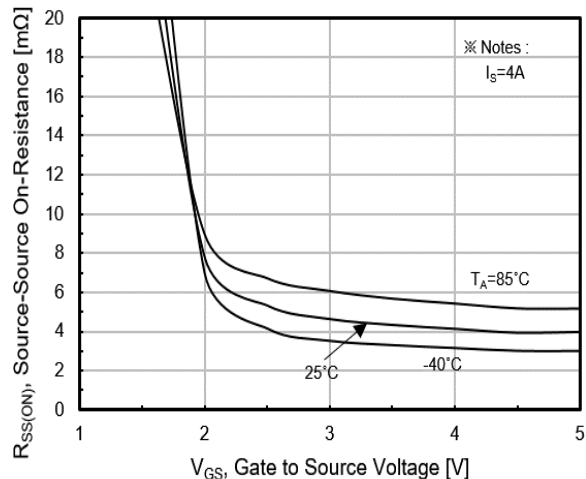
**Fig.1 On-Region Characteristics**



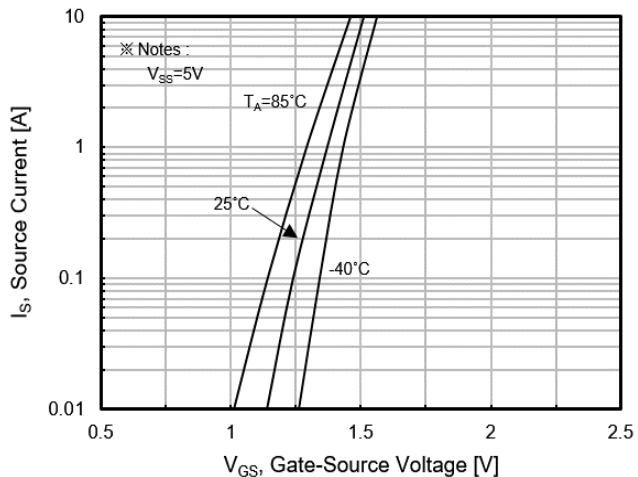
**Fig.2 On-Resistance Variation with Source Current and Gate Voltage**



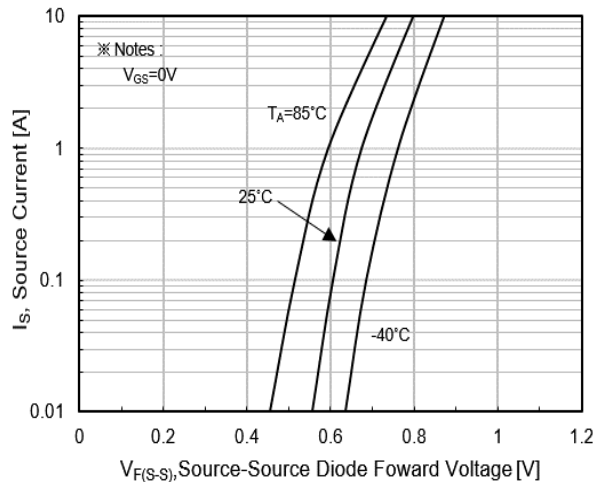
**Fig.3 On-Resistance Variation with Temperature**



**Fig.4 On-Resistance Variation with Gate to Source Voltage**

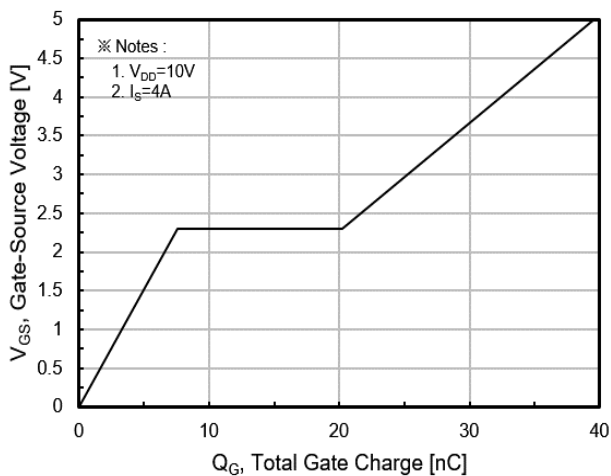


**Fig.5 Transfer Characteristics**

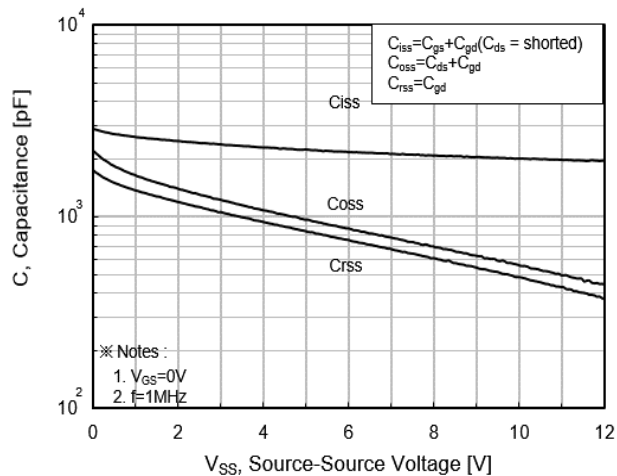


**Fig.6 Body Diode Forward Voltage**

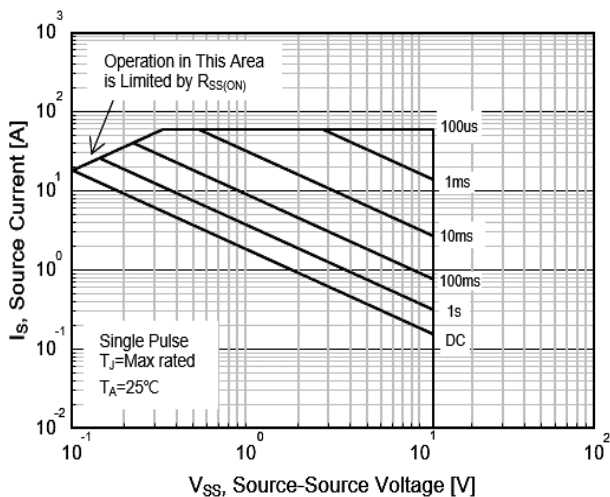
### Characteristic Graph



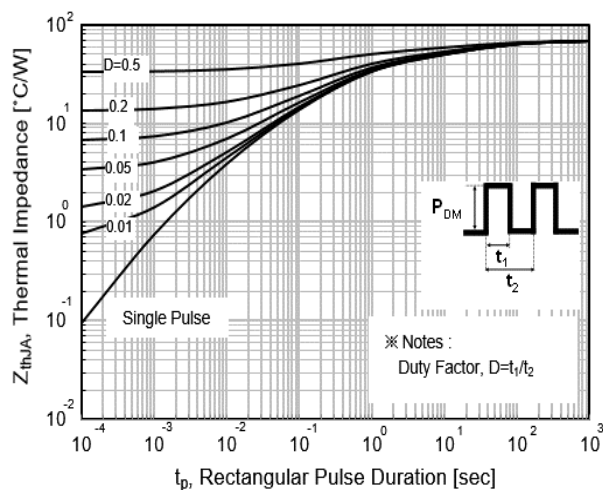
**Fig.7 Gate Charge Characteristics**



**Fig.8 Capacitance Characteristics**

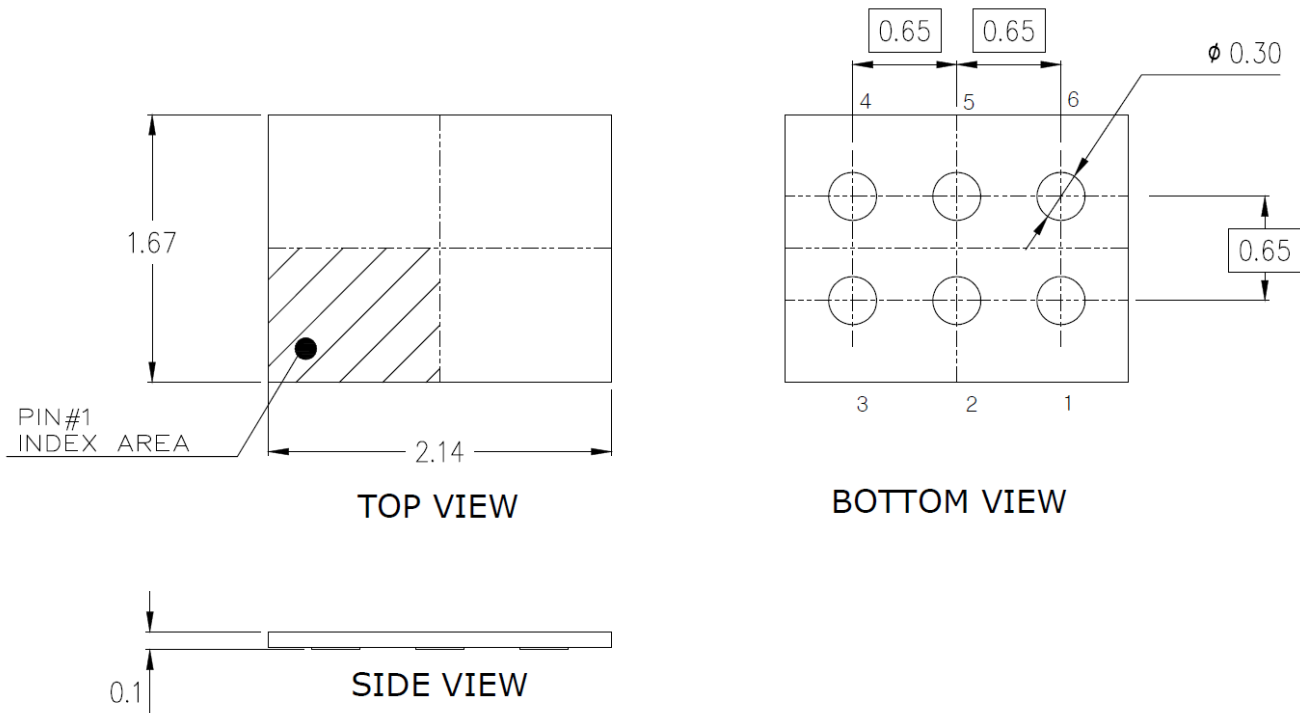


**Fig.9 Maximum Safe Operating Area**



**Fig.10 Transient Thermal Impedance Curve**

**PACKAGE OUTLINE**




**Note :**

- 1) ALL DIMENSIONS ARE IN MILLIMETERS.
- 2) GENERAL TOLERANCE :  $\pm 0.03$  mm
- 3) PACKAGE BODY SIZES EXCLUDE FLASH & BURRS

**DISCLAIMER:**

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