RoHS Compliant

Magnachip

MDW24D066E

Common-Drain Dual N-Channel Trench MOSFET 24V, 6.6 mΩ

General Description

The MDW24D066E uses advanced Magnachip's MOSFET Technology, which provides high performance in on-state resistance and excellent reliability. Excellent low $R_{DS(ON)}$, low gate charge operation and operation for Battery Application.

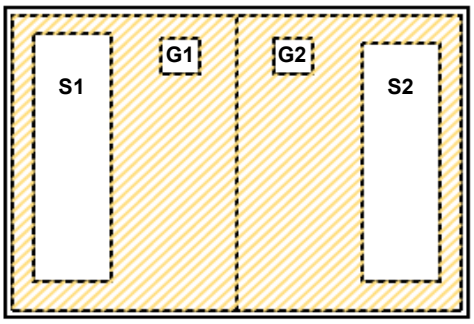
Features

- V_{DS} = 24V
- Drain - Source ON Resistance;
  $R_{DS(ON)}$ < 6.6mΩ @ V_{GS} = 3.9V
  $R_{DS(ON)}$ < 8.7mΩ @ V_{GS} = 3.1V

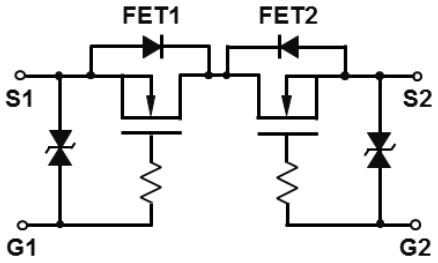
Applications

- Portable Battery Protection

Bottom View



Drain is the backside of the wafer (TOP View)



Absolute Maximum Ratings

Characteristics	Symbol	Ratings	Units
Drain-Source Voltage	V_{DSS}	24	V
Gate-Source Voltage	V_{GSS}	±12	V
Junction and Storage Temperature Range	T_J, T_{stg}	-55~150	℃

Mechanical Data

Contents	Value
Wafer Thickness	140um ± 10um
Metal (Top)	Al (45,000 Å)
Metal (Back)	NiV (3,000 Å) – Ag (1,500 Å)
Passivation Layer	Yes
Die Size (With Scribe lane)	1,240 x 2,000 um^2
Scribe lane width	60 um
Gate Pad Size	150 x 150 um^2

Electrical Characteristics (T_A =25ºC unless otherwise noted)

Characteristics	Symbol	Test Condition	Min	Typ	Max	Units
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	I_D = 250uA, V_{GS} = 0V	24	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250uA	0.5	0.95	1.5	
Cut-Off Current	I_{DSS}	V_{DS} = 20V, V_{GS} = 0V	-	-	1.0	μA
Gate Leakage Current	I_{GSS}	V_{GS} = ±12V, V_{DS} = 0V	-	-	10	μA
Drain-Source Resistance Note 1	$R_{DS(ON)}$	V_{GS} = 3.9V, I_D = 5.0A	-	5.2	6.6	mΩ
		V_{GS} = 3.1V, I_D = 5.0A	-	6.2	8.7	
Dynamic Characteristics						
Total Gate Charge	Q_g	V_{DD} = 12V, I_D = 5.0A, V_{GS} = 3.9V	-	16.5	-	nC
Gate-Source Charge	Q_{gs}		-	2.4	-	
Gate-Drain Charge	Q_{gd}		-	9.8	-	
Input Capacitance	C_{iss}	V_{DS} = 12V, V_{GS} = 0V, f = 50kHz	-	1680	-	pF
Reverse Transfer Capacitance	C_{rss}		-	418	-	
Output Capacitance	C_{oss}		-	459	-	
Turn-On Delay Time	$t_{d(on)}$	V_{GS} = 3.9V, V_{DD} = 12V, I_D = 5.0A, R_{GEN} = 3Ω	-	0.04	-	μs
Rise Time	t_r		-	0.20	-	
Turn-Off Delay Time	$t_{d(off)}$		-	1.67	-	
Fall Time	t_f		-	4.91	-	
Drain-Source Body Diode Characteristics						
Source-Drain Diode Forward Voltage	V_{SD}	I_S = 5A, V_{GS} = 0V		0.75	1.0	V

Notes :

1. $R_{DS(ON)}$ is the value for Single MOS.
2. Dynamic Characteristics are tested on ITM Package.

Characteristic Graph

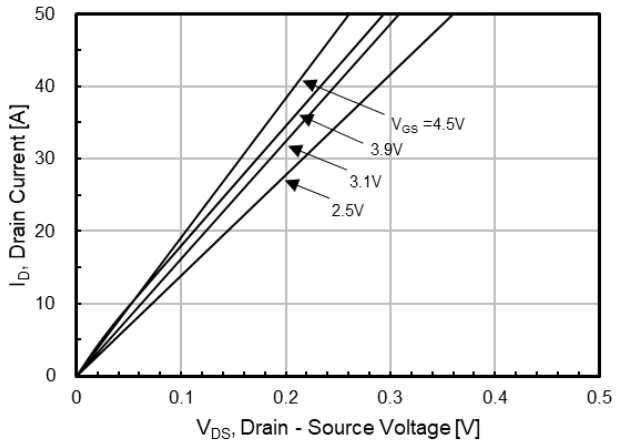


Fig.1 On-Region Characteristics

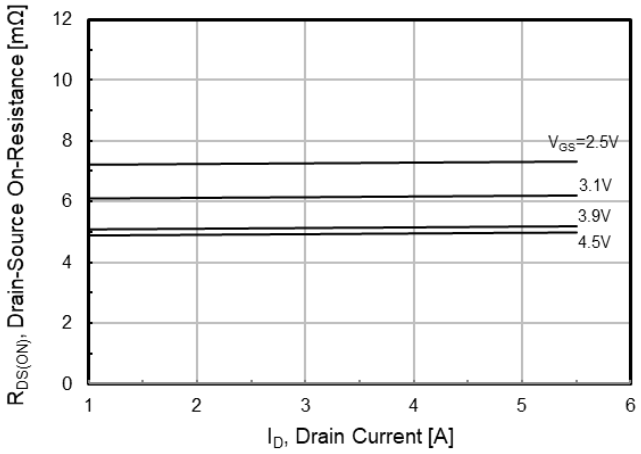


Fig.2 On-Resistance Variation with Drain Current and Gate Voltage

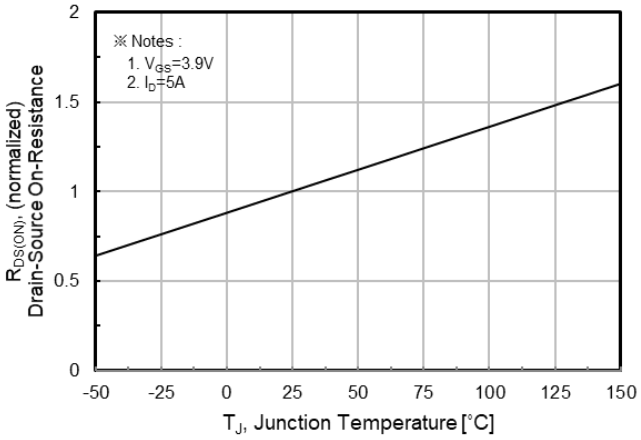


Fig.3 On-Resistance Variation with Temperature

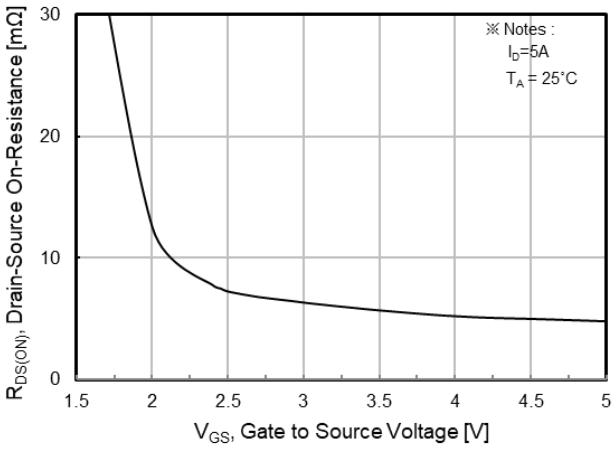


Fig.4 On-Resistance Variation with Gate to Source Voltage

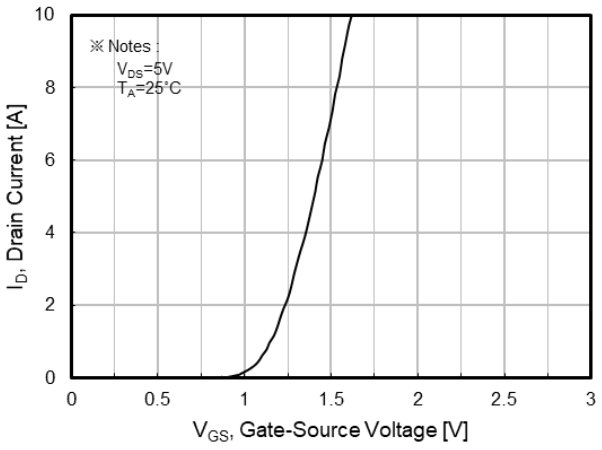


Fig.5 Transfer Characteristics

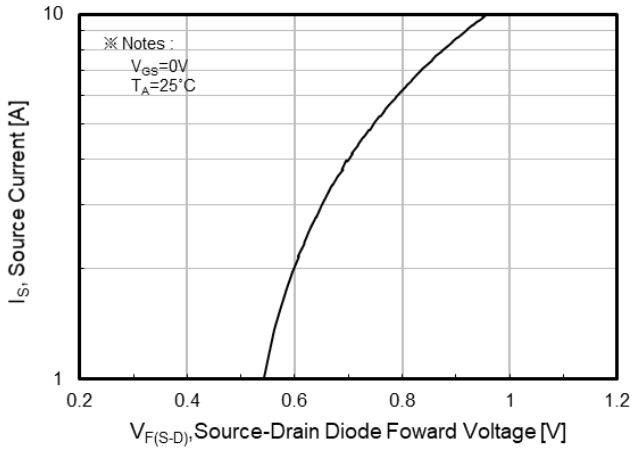


Fig.6 Body Diode Forward Voltage Variation with Source Current

Characteristic Graph

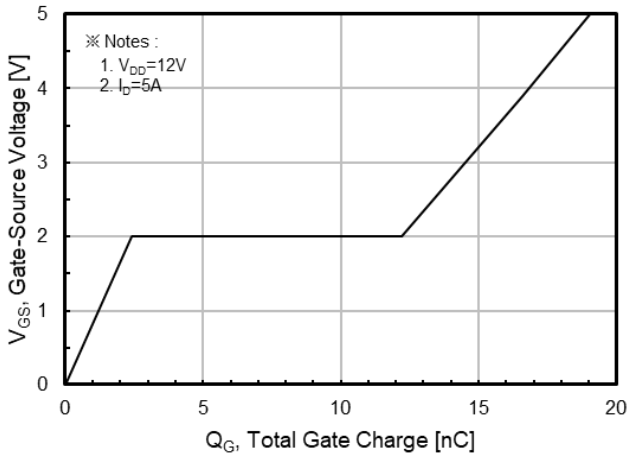


Fig.7 Gate Charge Characteristics

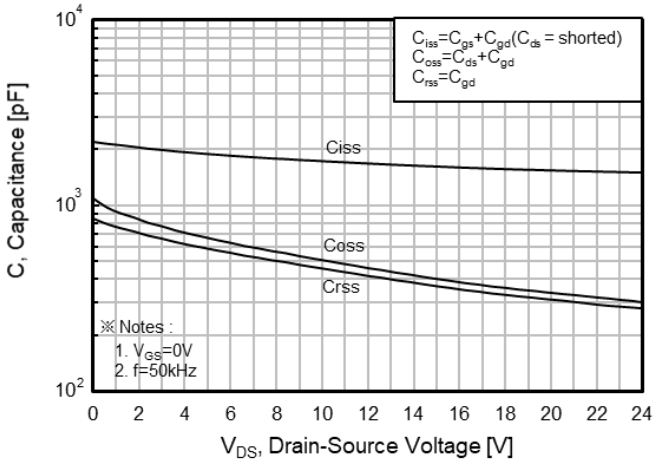
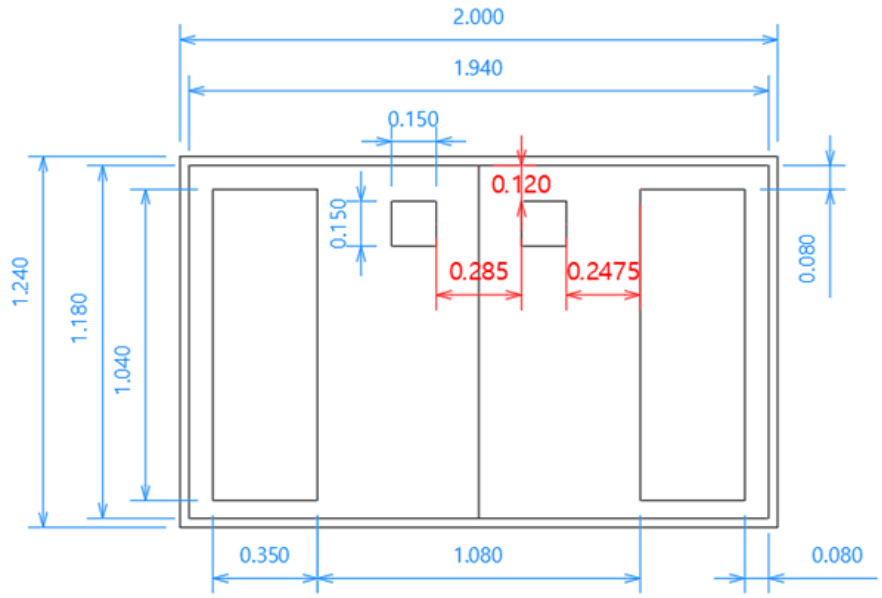


Fig.8 Capacitance Characteristics

DIE OUTLINE (Unit : mm)



DISCLAIMER:

The Products are not designed for use in hostile environments, including, without limitation, aircraft, nuclear power generation, medical appliances, and devices or systems in which malfunction of any Product can reasonably be expected to result in a personal injury. Seller's customers using or selling Seller's products for use in such applications do so at their own risk and agree to fully defend and indemnify Seller.