

# MDD1051

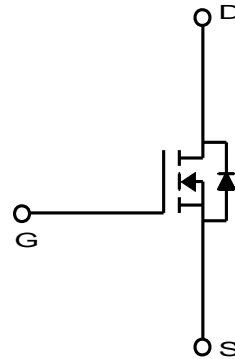
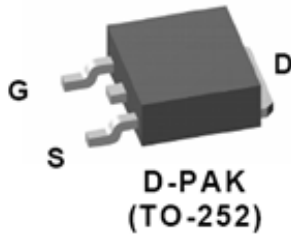
## Single N-channel Trench MOSFET 150V, 28A, 46mΩ

### General Description

The MDD1051 uses advanced MagnaChip's MOSFET Technology, which provides high performance in on-state resistance, fast switching performance and excellent quality. MDD1051 is suitable device for Synchronous Rectification For Server and general purpose applications.

### Features

- $V_{DS} = 150V$
- $I_D = 28A @ V_{GS} = 10V$
- $R_{DS(ON)} < 46.0 m\Omega @ V_{GS} = 10V$
- 100% UIL Tested
- 100% Rg Tested



### Absolute Maximum Ratings (Ta = 25°C)

Characteristics		Symbol	Rating	Unit
Drain-Source Voltage		$V_{DSS}$	150	V
Gate-Source Voltage		$V_{GSS}$	±20	V
Continuous Drain Current <sup>(1)</sup>	$T_C=25^\circ C$ (Silicon Limited)	$I_D$	28	A
	$T_C=100^\circ C$		18	
Pulsed Drain Current		$I_{DM}$	110	
Power Dissipation	$T_C=25^\circ C$	$P_D$	70	W
	$T_C=100^\circ C$		28	
Single Pulse Avalanche Energy <sup>(2)</sup>		$E_{AS}$	40.5	mJ
Junction and Storage Temperature Range		$T_J, T_{stg}$	-55~150	°C

### Thermal Characteristics

Characteristics	Symbol	Rating	Unit
Thermal Resistance, Junction-to-Ambient <sup>(1)</sup>	$R_{\theta JA}$	50	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.8	

### Ordering Information

Part Number	Temp. Range	Package	Packing	RoHS Status
MDD1051RH	-55~150°C	D-PAK	Tape & Reel	Halogen Free

### Electrical Characteristics (T<sub>J</sub> =25°C)

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	I <sub>D</sub> = 250μA, V <sub>GS</sub> = 0V	150	-	-	V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	1.2	2.2	3.2	
Drain Cut-Off Current	I <sub>DSS</sub>	V <sub>DS</sub> = 120V, V <sub>GS</sub> = 0V	-	-	1.0	μA
Gate Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V	-	-	±0.1	
Drain-Source ON Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 20A	-	37.0	46.0	mΩ
Forward Transconductance	g <sub>fs</sub>	V <sub>DS</sub> = 10V, I <sub>D</sub> = 20A	-	30	-	S
<b>Dynamic Characteristics</b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = 75V, I <sub>D</sub> = 20A, V <sub>GS</sub> = 10V	-	19.6	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	5.2	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	5.2	-	
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 40V, V <sub>GS</sub> = 0V, f = 1.0MHz	-	1270	-	pF
Reverse Transfer Capacitance	C <sub>rss</sub>		-	40	-	
Output Capacitance	C <sub>oss</sub>		-	405	-	
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>GS</sub> = 10V, V <sub>DS</sub> = 75V, I <sub>D</sub> = 20A, R <sub>G</sub> = 3.0Ω	-	15	-	ns
Rise Time	t <sub>r</sub>		-	10	-	
Turn-Off Delay Time	t <sub>d(off)</sub>		-	20	-	
Fall Time	t <sub>f</sub>		-	5	-	
Gate Resistance	R <sub>g</sub>	f=1 MHz	-	1.8	-	Ω
<b>Drain-Source Body Diode Characteristics</b>						
Source-Drain Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> = 20A, V <sub>GS</sub> = 0V	-	0.9	1.3	V
Body Diode Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 20A, di/dt = 100A/μs	-	73	-	ns
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>		-	245	-	nC

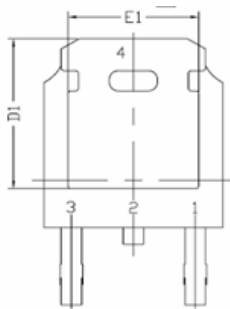
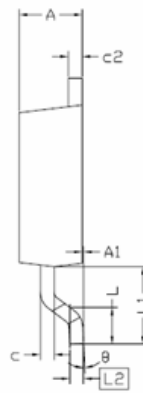
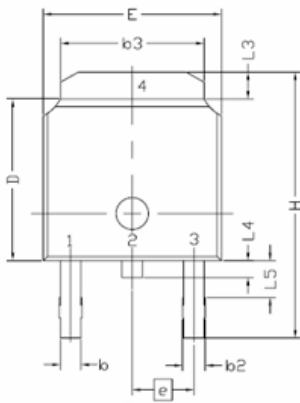
Note :

- Surface mounted FR-4 board by JEDEC (jesd51-7). Continuous current at T<sub>C</sub>=25°C is silicon limited
- E<sub>AS</sub> is tested at starting T<sub>J</sub> = 25°C, L = 1.0mH, I<sub>AS</sub> = 9.0A, V<sub>GS</sub> = 10V.

## Package Dimension

### 2 Leads, DPAK (TO-252)

Dimensions are in millimeters unless otherwise specified



Symbol	Min.	Nom.	Max.
E	6.35	-	6.73
L	1.40	1.52	1.78
L1	2.74 REF		
L2	0.508 BCS		
L3	0.89	-	1.27
L4	-	-	1.02
L5	1.14	-	1.52
D	5.97	6.10	6.22
H	9.40	-	10.41
b	0.64	-	0.89
b2	0.76	-	1.14
b3	4.95	-	5.46
e	2.286 BSC		
A	2.18	-	2.39
A1	-	-	0.13
c	0.46	-	0.61
c2	0.46	-	0.89
D1	5.21	-	-
E1	4.32	-	-
ø	0.00	-	10.00

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