

### General Description

These N-channel MOSFET are produced using advanced MagnaChip's MOSFET Technology, which provides low on-state resistance, high switching performance and excellent quality.

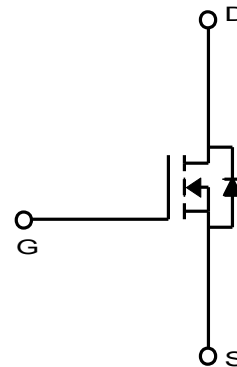
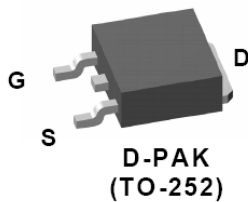
These devices are suitable device for SMPS, high Speed switching and general purpose applications.

### Features

- $V_{DS} = 250V$
- $I_D = 10.2A$
- $R_{DS(ON)} \leq 0.28\Omega$  @  $V_{GS} = 10V$

### Applications

- Power Supply
- Motor Control
- High Current, High Speed Switching



### Absolute Maximum Ratings ( $T_a = 25^\circ C$ )

Characteristics		Symbol	Rating	Unit
Drain-Source Voltage		$V_{DSS}$	250	V
Gate-Source Voltage		$V_{GSS}$	$\pm 30$	V
Continuous Drain Current	$T_C = 25^\circ C$	$I_D$	10.2	A
	$T_C = 100^\circ C$		6.4	A
Pulsed Drain Current <sup>(1)</sup>		$I_{DM}$	40.8	A
Power Dissipation	$T_C = 25^\circ C$	$P_D$	69.4	W
	Derivate above $25^\circ C$		0.56	W/ $^\circ C$
Peak Diode Recovery $dv/dt$ <sup>(3)</sup>		$dv/dt$	4.5	V/ns
Repetitive Avalanche Energy <sup>(1)</sup>		$E_{AR}$	6.94	mJ
Avalanche current <sup>(1)</sup>		$I_{AR}$	10.2	A
Single Pulse Avalanche Energy <sup>(4)</sup>		$E_{AS}$	550	mJ
Junction and Storage Temperature Range		$T_J, T_{stg}$	-55~150	$^\circ C$

### Thermal Characteristics

Characteristics	Symbol	Rating	Unit
Thermal Resistance, Junction-to-Ambient <sup>(1)</sup>	$R_{\theta JA}$	110	$^\circ C/W$
Thermal Resistance, Junction-to-Case <sup>(1)</sup>	$R_{\theta JC}$	1.8	

## Ordering Information

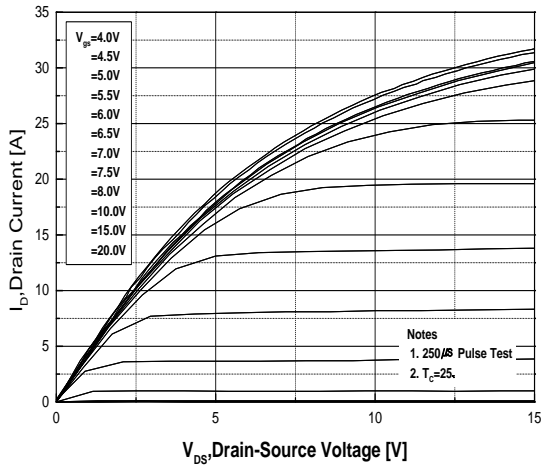
Part Number	Temp. Range	Package	Packing	RoHS Status
MDD14N25CRH	-55~150°C	D-pak	Reel & Tape	Halogen Free

## Electrical Characteristics (Ta =25°C)

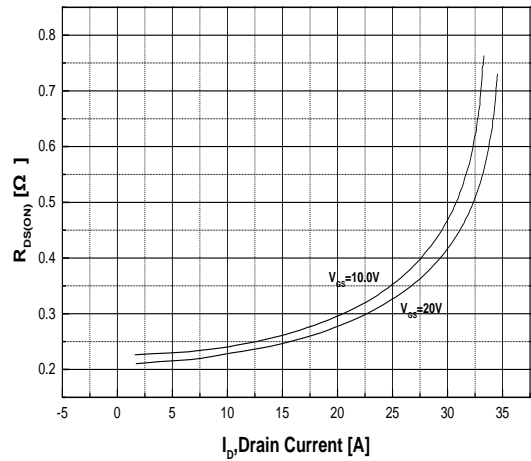
Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$I_D = 250\mu A, V_{GS} = 0V$	250	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.0	-	4.0	
Drain Cut-Off Current	$I_{DSS}$	$V_{DS} = 250V, V_{GS} = 0V$	-	-	1	$\mu A$
Gate Leakage Current	$I_{GSS}$	$V_{GS} = \pm 30V, V_{DS} = 0V$	-	-	100	nA
Drain-Source ON Resistance	$R_{DS(ON)}$	$V_{GS} = 10V, I_D = 5.1 A$	-	0.22	0.28	$\Omega$
Forward Transconductance	$g_{fs}$	$V_{DS} = 30V, I_D = 5.1A$	-	8.5	-	S
<b>Dynamic Characteristics</b>						
Total Gate Charge	$Q_g$	$V_{DS} = 200V, I_D = 14.0A, V_{GS} = 10V$	-	20.0	-	nC
Gate-Source Charge	$Q_{gs}$		-	4.5	-	
Gate-Drain Charge	$Q_{gd}$		-	8.9	-	
Input Capacitance	$C_{iss}$	$V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz$	-	741	-	pF
Reverse Transfer Capacitance	$C_{rss}$		-	15	-	
Output Capacitance	$C_{oss}$		-	142	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{GS} = 10V, V_{DS} = 125V, I_D = 14.0A, R_G = 25\Omega^{(3)}$	-	13	-	ns
Rise Time	$t_r$		-	42	-	
Turn-Off Delay Time	$t_{d(off)}$		-	44	-	
Fall Time	$t_f$		-	28	-	
<b>Drain-Source Body Diode Characteristics</b>						
Maximum Continuous Drain to Source Diode Forward Current	$I_S$		-	-	10.2	A
Source-Drain Diode Forward Voltage	$V_{SD}$	$I_S = 10.2A, V_{GS} = 0V$	-	-	1.4	V
Body Diode Reverse Recovery Time	$t_{rr}$	$I_F = 14.0A, di/dt = 100A/\mu s^{(3)}$	-	174	-	ns
Body Diode Reverse Recovery Charge	$Q_{rr}$		-	1.0	-	$\mu C$

Note :

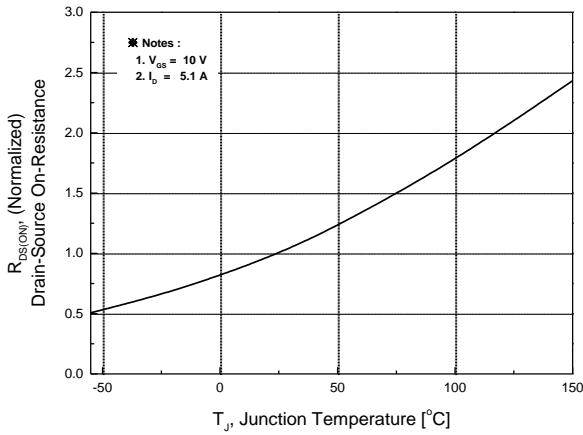
- Pulse width is based on  $R_{\theta JC}$  &  $R_{\theta JA}$  and the maximum allowed junction temperature of 150°C.
- Pulse test: pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ , pulse width limited by junction temperature  $T_{J(MAX)} = 150^\circ C$ .
- $I_{SD} \leq 10.2A, di/dt \leq 300A/\mu s, V_{DD} \leq BV_{dss}, R_g = 25\Omega$ , Starting  $T_J = 25^\circ C$
- $L = 8.5mH, I_{AS} = 10.2A, V_{DD} = 50V, R_g = 26\Omega$ , Starting  $T_J = 25^\circ C$



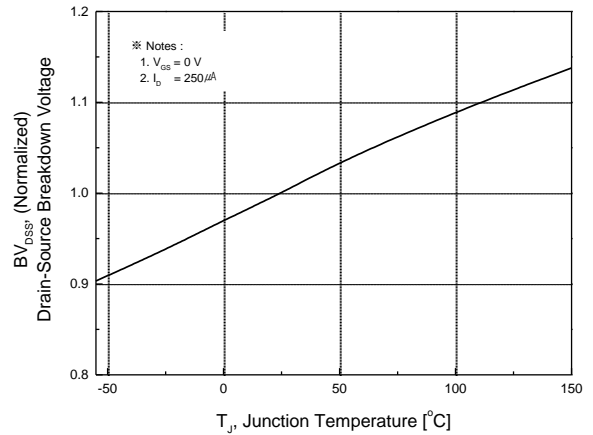
**Fig.1 On-Region Characteristics**



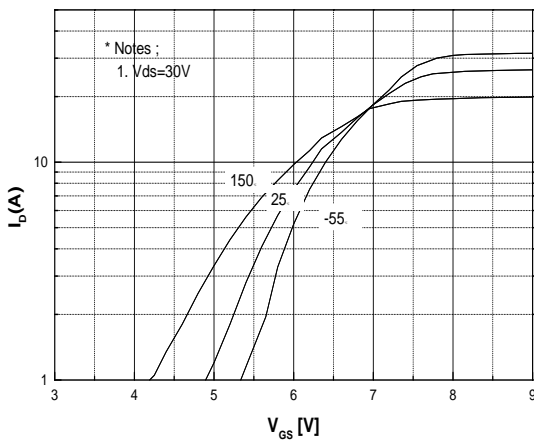
**Fig.2 On-Resistance Variation with Drain Current and Gate Voltage**



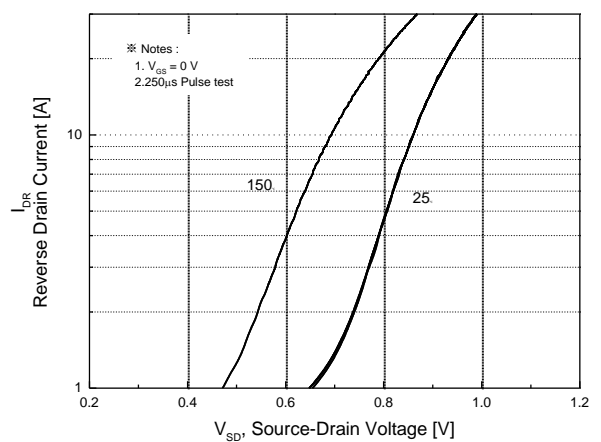
**Fig.3 On-Resistance Variation with Temperature**



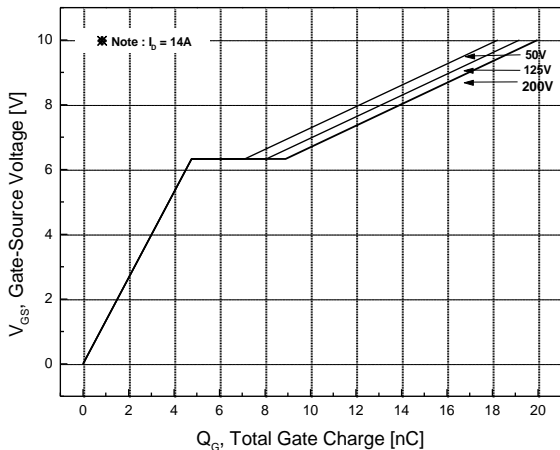
**Fig.4 Breakdown Voltage Variation vs. Temperature**



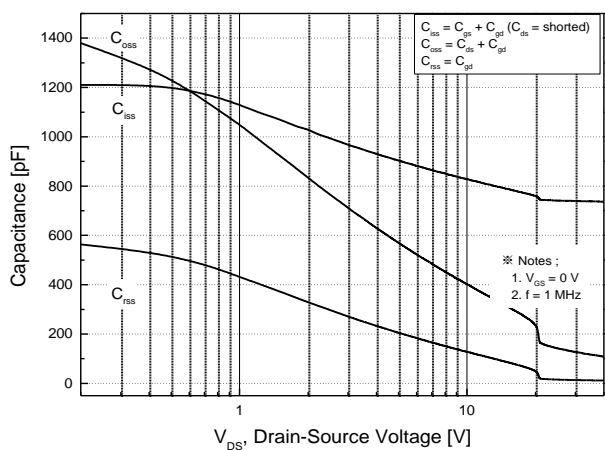
**Fig.5 Transfer Characteristics**



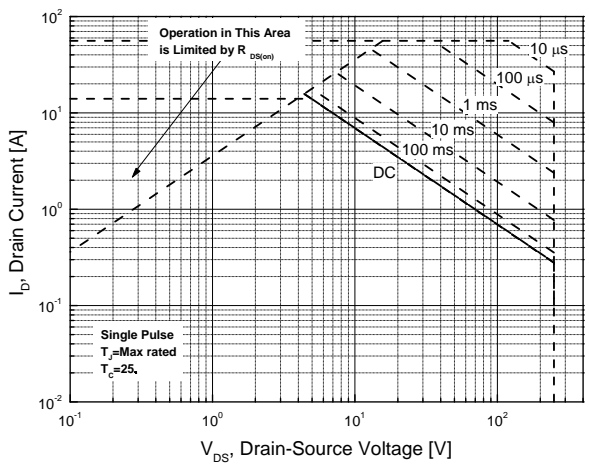
**Fig.6 Body Diode Forward Voltage Variation with Source Current and Temperature**



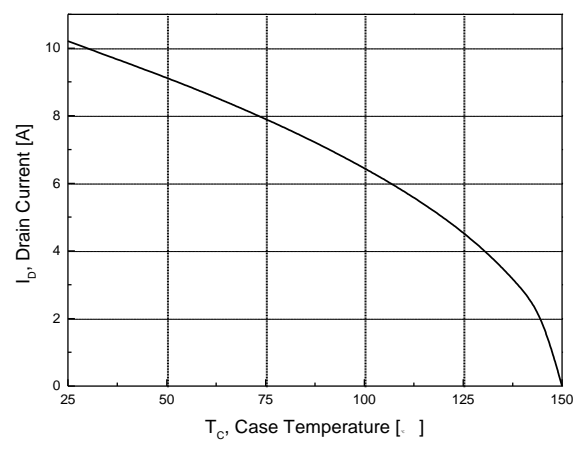
**Fig.7 Gate Charge Characteristics**



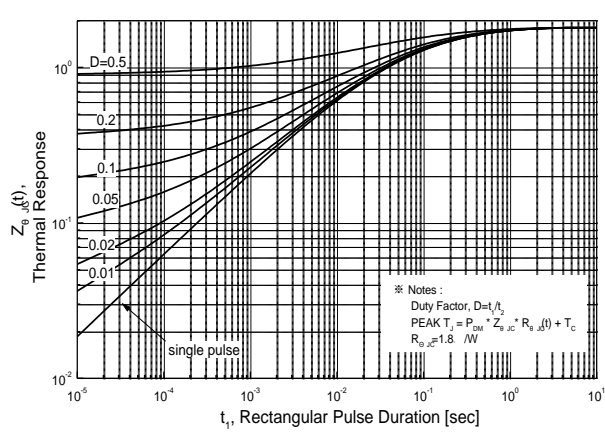
**Fig.8 Capacitance Characteristics**



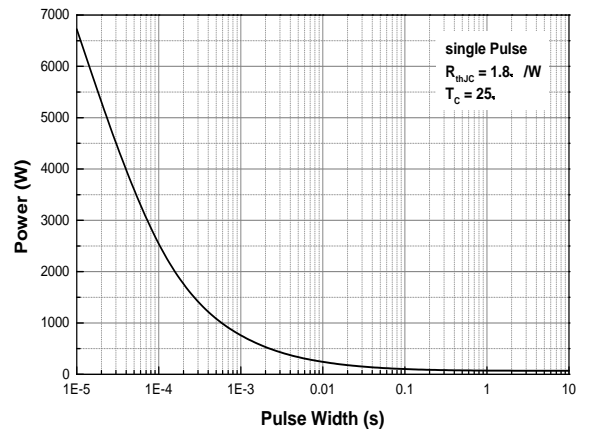
**Fig.9 Maximum Safe Operating Area**



**Fig.10 Maximum Drain Current vs. Case Temperature**



**Fig.11 Transient Thermal Response Curve**

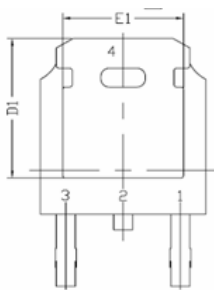
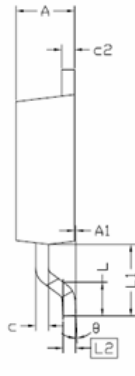
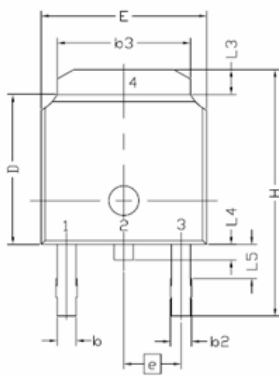


**Fig.12 Single Pulse Maximum Power Dissipation**

## Physical Dimension

### D-PAK, 3L

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	-	-
⌀	0.00	-	10.00

**DISCLAIMER:**

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