

### 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.

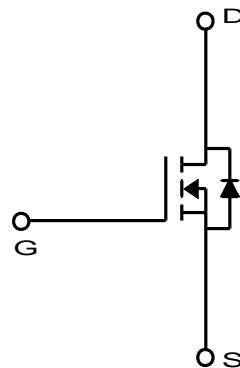
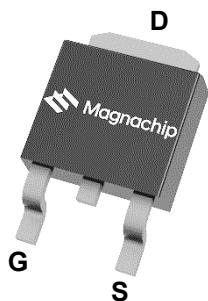
These devices are suitable device for SMPS, high Speed switching and general purpose applications.

### Features

- $V_{DS} = 600V$
- $I_D = 1.9A$  @  $V_{GS} = 10V$
- $R_{DS(ON)} \leq 4.5\Omega$  @  $V_{GS} = 10V$

### Applications

- Power Supply
- PFC
- High Current, High Speed Switching



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

Characteristics	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DSS}$	600	V
Gate-Source Voltage	$V_{GSS}$	$\pm 30$	V
Continuous Drain Current	$I_D$	1.9	A
		1.2	A
Pulsed Drain Current <sup>(1)</sup>	$I_{DM}$	7.6	A
Power Dissipation	$P_D$	42	W
		0.34	$W/^\circ C$
Repetitive Avalanche Energy <sup>(1)</sup>	$E_{AR}$	4.2	mJ
Peak Diode Recovery $dv/dt$ <sup>(3)</sup>	$dv/dt$	4.5	V/ns
Single Pulse Avalanche Energy <sup>(4)</sup>	$E_{AS}$	115	mJ
Junction and Storage Temperature Range	$T_J, T_{stg}$	-55~150	$^\circ C$

\*  $I_D$  limited by maximum junction temperature

### Thermal Characteristics

Characteristics	Symbol	Rating	Unit
Thermal Resistance, Junction-to-Ambient <sup>(1)</sup>	$R_{BJA}$	110	$^\circ C/W$
Thermal Resistance, Junction-to-Case <sup>(1)</sup>	$R_{BUC}$	2.98	

## Ordering Information

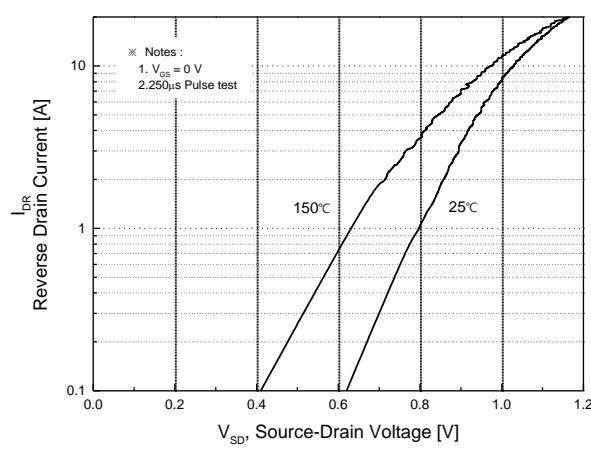
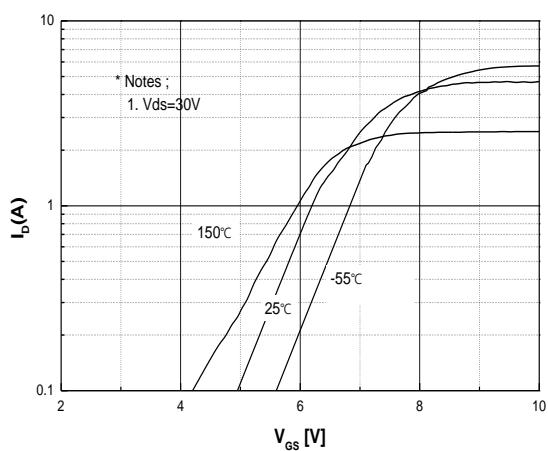
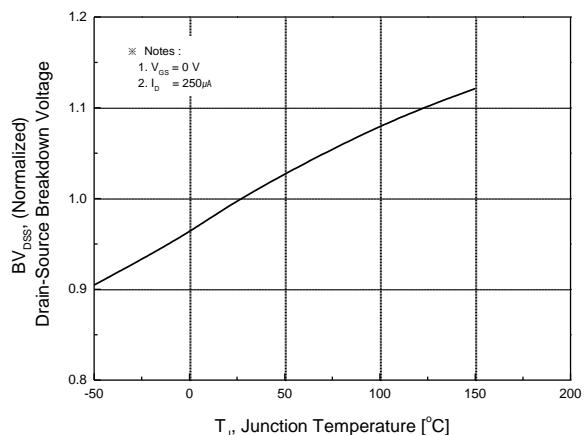
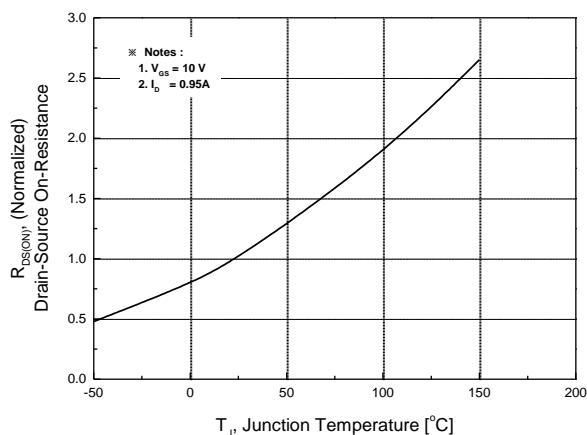
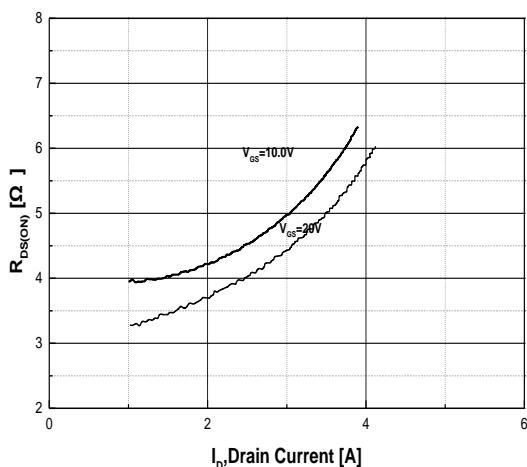
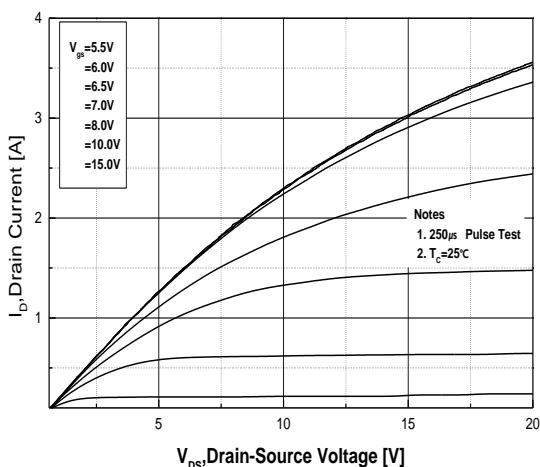
Part Number	Temp. Range	Package	Packing	RoHS Status
MDD2N60RH	-55~150°C	TO-252 (DPAK)	Reel	Halogen Free

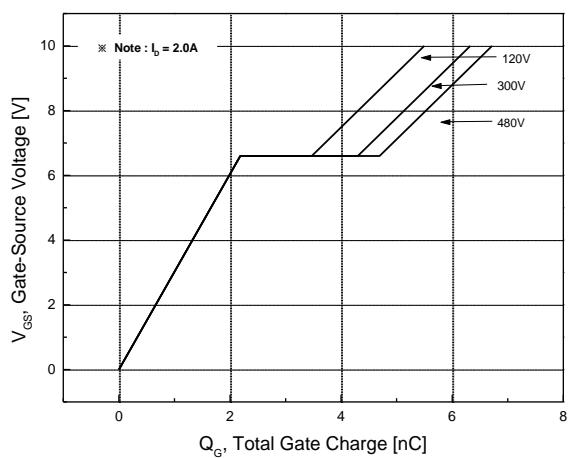
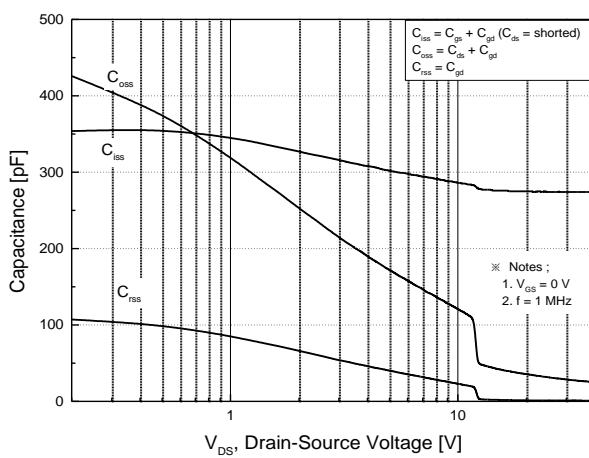
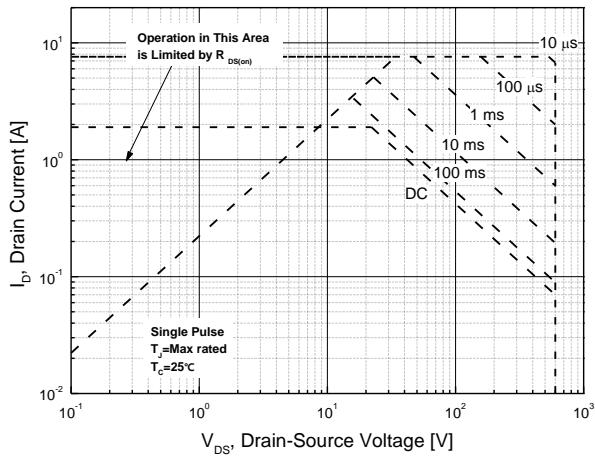
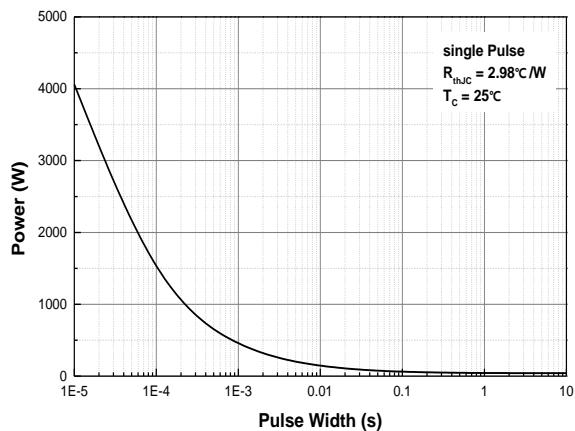
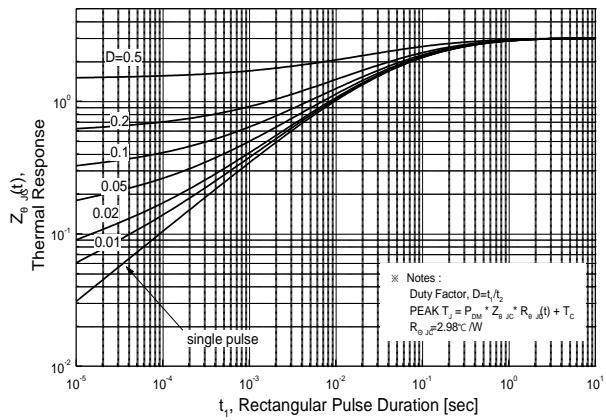
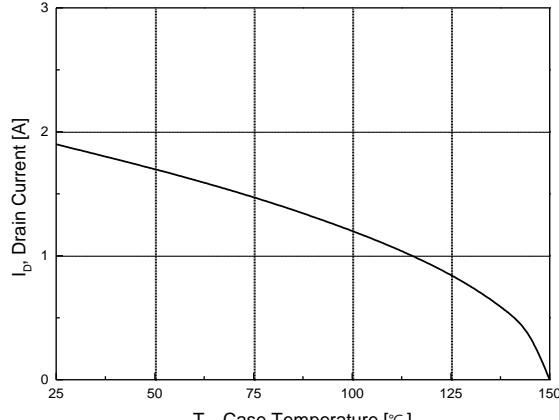
## Electrical Characteristics (Ta =25°C)

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	600	-	-	V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	3.0	-	5.0	
Drain Cut-Off Current	I <sub>DSS</sub>	V <sub>DS</sub> = 600V, V <sub>GS</sub> = 0V	-	-	1	μA
Gate Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±30V, V <sub>DS</sub> = 0V	-	-	100	nA
Drain-Source ON Resistance	R <sub>D(S)ON</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 0.95A		3.6	4.5	Ω
Forward Transconductance	g <sub>fs</sub>	V <sub>DS</sub> = 30V, I <sub>D</sub> = 1.0A	-	0.5	-	S
<b>Dynamic Characteristics</b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = 480V, I <sub>D</sub> = 2.0A, V <sub>GS</sub> = 10V <sup>(3)</sup>	-	6.7		
Gate-Source Charge	Q <sub>gs</sub>		-	2.2		nC
Gate-Drain Charge	Q <sub>gd</sub>		-	2.5		
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 25V, V <sub>GS</sub> = 0V, f = 1.0MHz	-	275	360	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	1.4	2	pF
Output Capacitance	C <sub>oss</sub>		-	32	40	
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>GS</sub> = 10V, V <sub>DS</sub> = 300V, I <sub>D</sub> = 2.0A, R <sub>G</sub> = 25Ω <sup>(3)</sup>	-	10.6		
Rise Time	t <sub>r</sub>		-	29.6		ns
Turn-Off Delay Time	t <sub>d(off)</sub>		-	40.4		
Fall Time	t <sub>f</sub>		-	38.4		
<b>Drain-Source Body Diode Characteristics</b>						
Maximum Continuous Drain to Source Diode Forward Current	I <sub>S</sub>		-	4.6	-	A
Source-Drain Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> = 1.9A, V <sub>GS</sub> = 0V	-		1.4	V
Body Diode Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 2.0A, di/dt = 100A/μs	-	206		ns
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>		-	0.76		μC

Note :

1. Pulse width is based on R<sub>θJC</sub> & R<sub>θJA</sub> and the maximum allowed junction temperature of 150°C.
2. Pulse test: pulse width ≤300us, duty cycle≤2%, pulse width limited by junction temperature T<sub>J(MAX)</sub>=150°C.
3. I<sub>SD</sub> ≤2.0A, di/dt≤200A/us, V<sub>DD</sub>=50V, R<sub>G</sub> =25Ω, Starting T<sub>J</sub>=25°C
4. L=53mH, I<sub>AS</sub>=2.0A, V<sub>DD</sub>=50V, R<sub>G</sub> =25Ω, Starting T<sub>J</sub>=25°C,



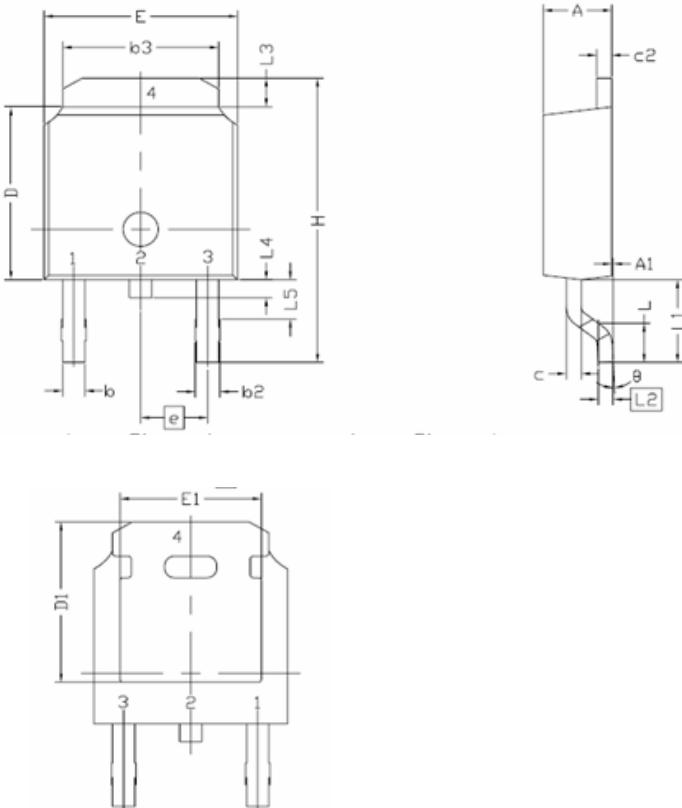

**Fig.7 Gate Charge Characteristics**

**Fig.8 Capacitance Characteristics**

**Fig.9 Maximum Safe Operating Area**

**Fig.10 Single Pulse Maximum Power Dissipation**

**Fig.11 Transient Thermal Response Curve**

**Fig.12 Maximum Drain Current vs. Case Temperature**



## Physical Dimension

### TO-252 (DPAK)

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	-	-
Φ	0.00	-	10.00

**DISCLAIMER:**

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