

MDD7N25

N-Channel MOSFET 250V, 6.2A, 0.55Ω

General Description

The MDD7N25 uses advanced Magnachip's MOSFET Technology, which provides low on-state resistance, high switching performance and excellent quality.

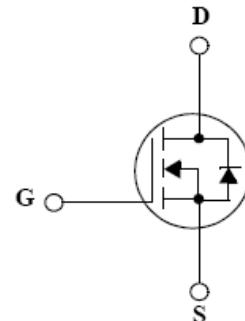
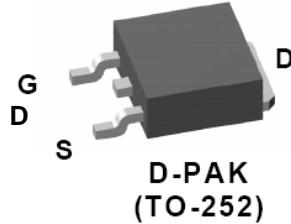
MDD7N25 is suitable device for SMPS, HID and general purpose applications.

Features

- $V_{DS} = 250V$
- $I_D = 6.2A$
- $R_{DS(ON)} \leq 0.55\Omega$ @ $V_{GS} = 10V$

Applications

- Power Supply
- PFC
- LED TV



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

Characteristics		Symbol	Rating	Unit
Drain-Source Voltage		V_{DSS}	250	V
Gate-Source Voltage		V_{GSS}	± 30	V
Continuous Drain Current	$T_C=25^\circ C$	I_D	6.2	A
	$T_C=100^\circ C$		3.9	A
Pulsed Drain Current ⁽¹⁾		I_{DM}	25	A
Power Dissipation	$T_C=25^\circ C$	P_D	56	W
	Derate above 25 °C		0.02	W/°C
MOSFET dv/dt ruggedness ⁽³⁾		dv/dt	15	V/ns
Peak Diode Recovery dv/dt ⁽³⁾		dv/dt	4.5	V/ns
Repetitive Pulse Avalanche Energy ⁽⁴⁾		E_{AR}	0.4	mJ
Avalanche current ⁽¹⁾		I_{AR}	5.6	A
Single Pulse Avalanche Energy ⁽⁴⁾		E_{AS}	115	mJ
Junction and Storage Temperature Range		T_J, T_{stg}	-55~150	°C

Thermal Characteristics

Characteristics		Symbol	Rating	Unit
Thermal Resistance, Junction-to-Ambient ⁽¹⁾	$R_{\theta JA}$	110	$^{\circ}C/W$	
Thermal Resistance, Junction-to-Case ⁽¹⁾		2.2		

Ordering Information

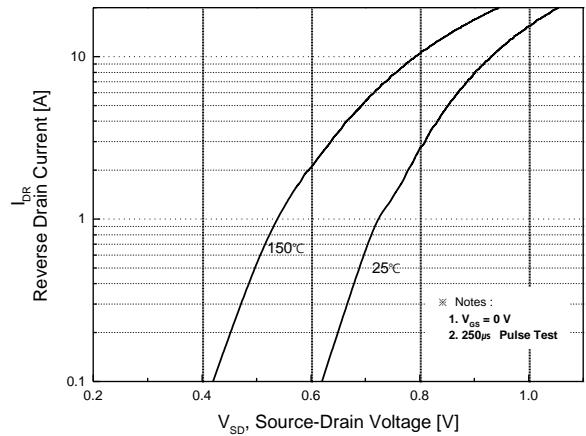
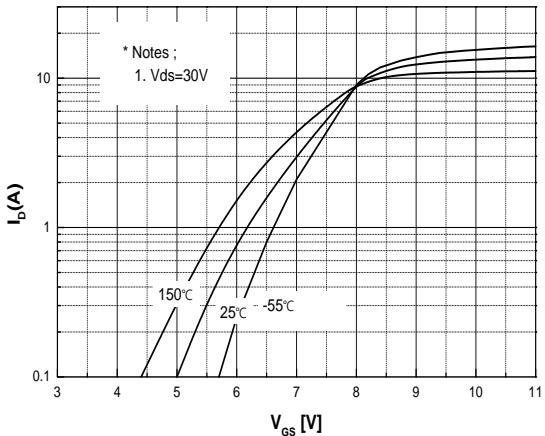
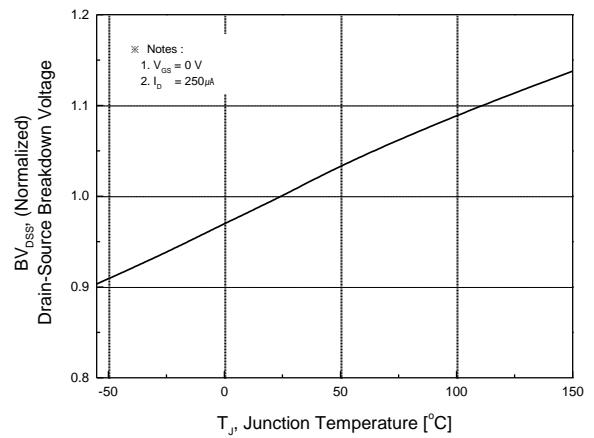
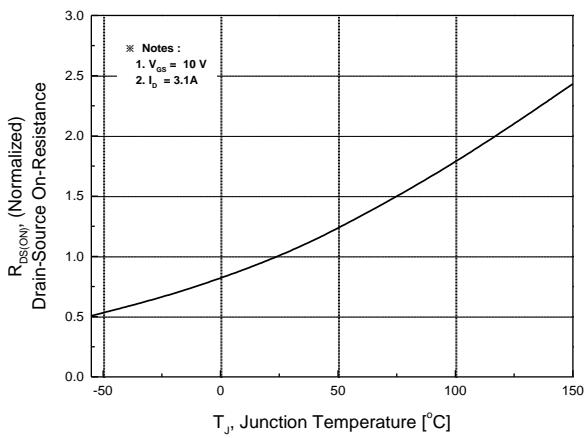
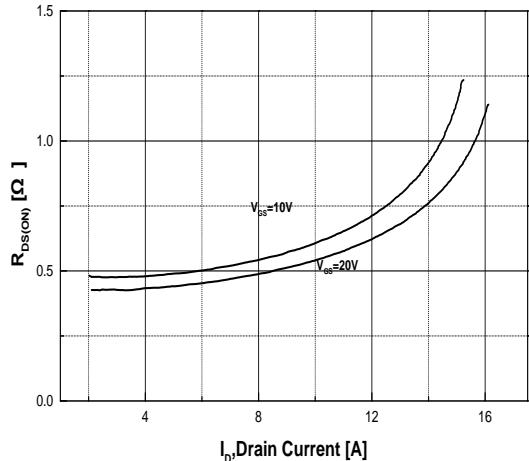
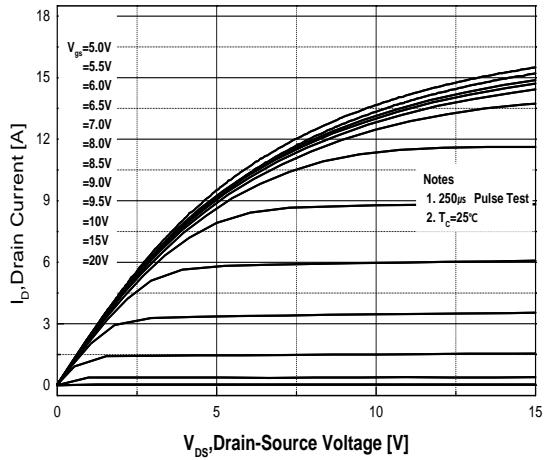
Part Number	Temp. Range	Package	Packing	RoHS Status
MDD7N25RH	-55~150°C	D-pak	Reel and Tape	Halogen Free

Electrical Characteristics (Ta =25°C)

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D = 250μA, V _{GS} = 0V	250	-	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	3.0	-	5.0	
Drain Cut-Off Current	I _{DSS}	V _{DS} = 250V, V _{GS} = 0V	-	-	1	μA
Gate Leakage Current	I _{GSS}	V _{GS} = ±30V, V _{DS} = 0V	-	-	100	nA
Drain-Source ON Resistance	R _{DS(ON)}	V _{GS} = 10V, I _D = 3.1A	-	0.43	0.55	Ω
Forward Transconductance	g _f	V _{DS} = 30V, I _D = 3.1A	-	3.0	-	S
Dynamic Characteristics						
Total Gate Charge	Q _g	V _{DS} = 200V, I _D = 7A, V _{GS} = 10V	-	10.4	-	nC
Gate-Source Charge	Q _{gs}		-	2.5	-	
Gate-Drain Charge	Q _{gd}		-	4.7	-	
Input Capacitance	C _{iss}	V _{DS} = 25V, V _{GS} = 0V, f = 1.0MHz	-	370	-	pF
Reverse Transfer Capacitance	C _{rss}		-	7.5	-	
Output Capacitance	C _{oss}		-	77.5	-	
Turn-On Delay Time	t _{d(on)}	V _{GS} = 10V, V _{DS} = 125V, I _D = 7A, R _G = 25Ω	-	12	-	ns
Rise Time	t _r		-	43	-	
Turn-Off Delay Time	t _{d(off)}		-	21	-	
Fall Time	t _f		-	34	-	
Drain-Source Body Diode Characteristics						
Maximum Continuous Drain to Source Diode Forward Current	I _S		-	-	6.2	A
Source-Drain Diode Forward Voltage	V _{SD}	I _S = 6.2A, V _{GS} = 0V	-	-	1.4	V
Body Diode Reverse Recovery Time	t _{rr}	I _F = 6.2A, dI/dt = 100A/μs ⁽³⁾	-	140	-	ns
Body Diode Reverse Recovery Charge	Q _{rr}		-	0.63	-	μC

Note :

1. Pulse width is based on R_{θJC} & R_{θJA} 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_{J(MAX)}=150°C.
3. I_{SD}≤6.2A, di/dt≤300A/us, V_{DD}≤BV_{DSS}, R_g =25Ω, Starting T_J=25°C
4. L=4.8mH, I_{AS}=6.2A, V_{DD}=50V, R_g =25Ω, Starting T_J=25°C



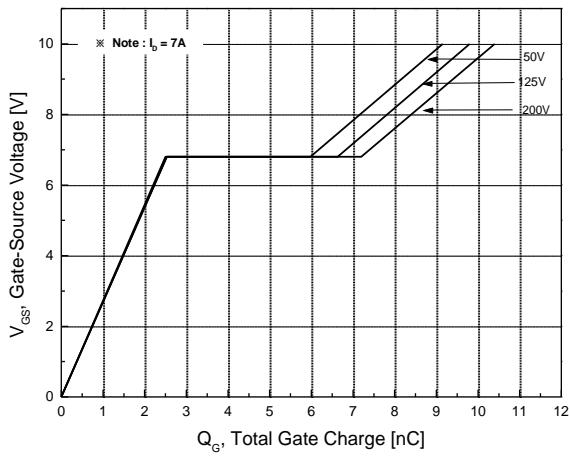


Fig.7 Gate Charge Characteristics

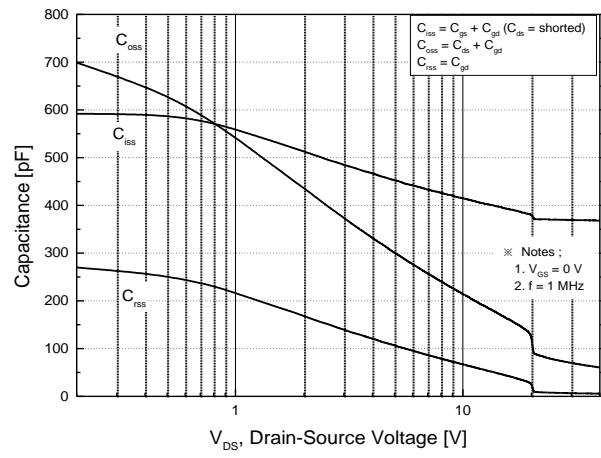


Fig.8 Capacitance Characteristics

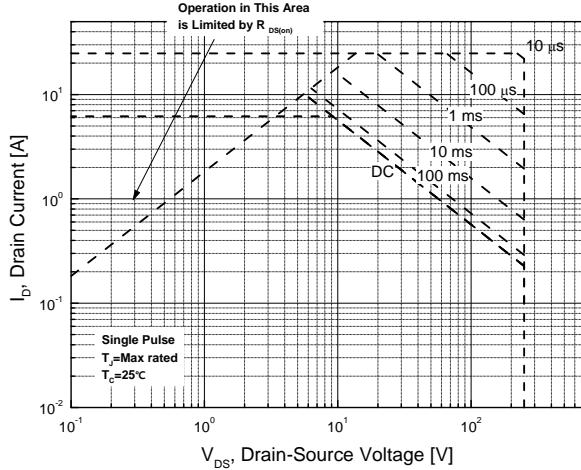


Fig.9 Maximum Safe Operating Area

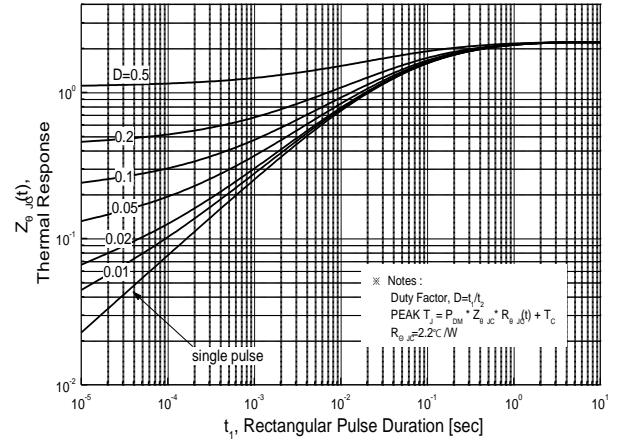


Fig.10 Transient Thermal Response Curve

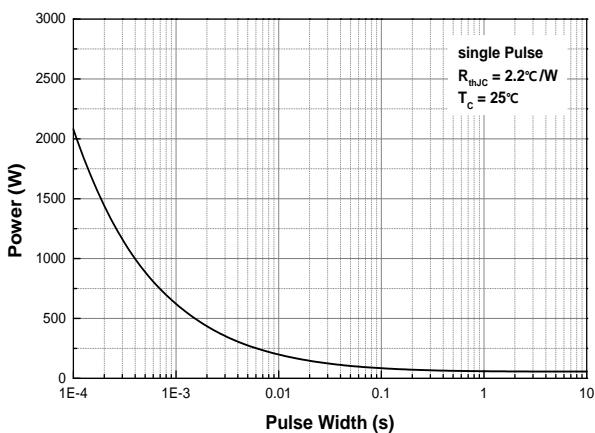


Fig.11 Single Pulse Maximum Power Dissipation

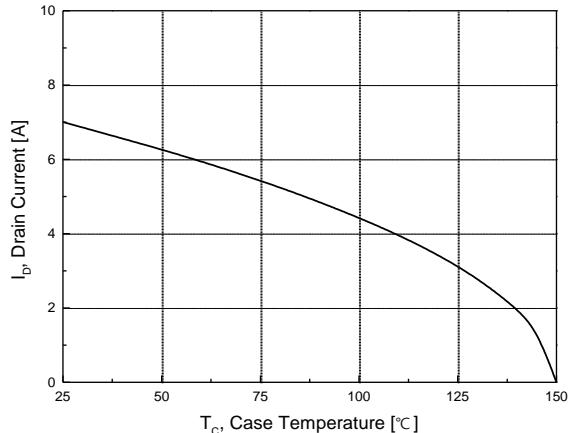
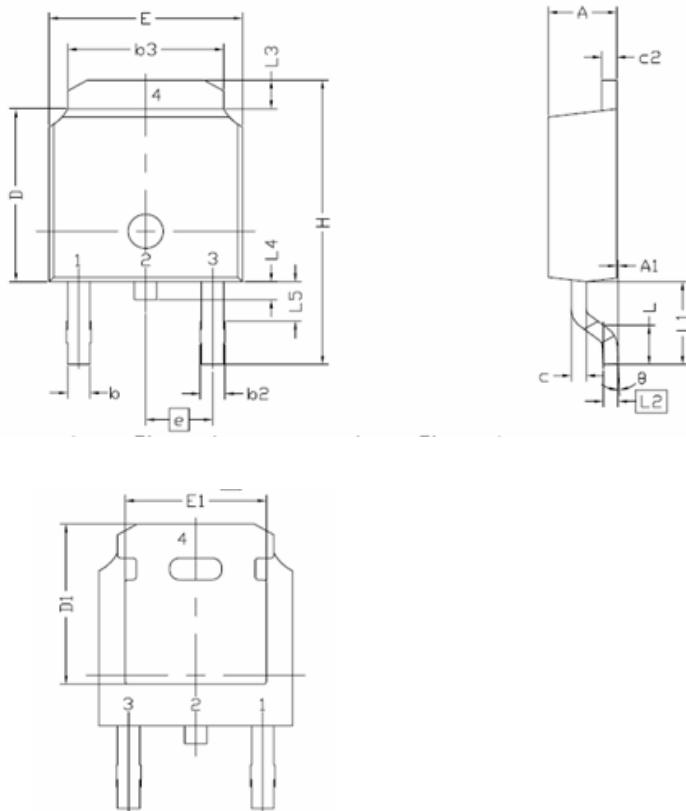


Fig.12 Maximum Drain Current vs. Case Temperature

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	-	-
Θ	0.00	-	10.00

Note : Package body size, length and width do not include mold flash, protrusions and gate burrs.

DISCLAIMER:

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