

# MDHT4N25

## N-Channel MOSFET 250V, 0.83A, 1.75Ω

MDHT4N25 N-channel MOSFET 250V

### General Description

The MDHT4N25 uses advanced Magnachip's MOSFET Technology, which provides low on-state resistance, high switching performance and excellent quality.

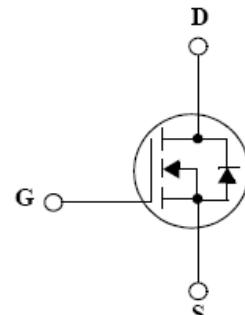
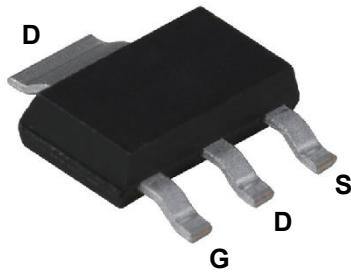
MDHT4N25 is suitable device for SMPS, HID and general purpose applications.

### Features

- $V_{DS} = 250V$
- $I_D = 0.83A$
- $R_{DS(ON)} \leq 1.75\Omega$  @ $V_{GS} = 10V$

### Applications

- Power Supply
- PFC
- LED TV



SOT-223

### 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	$I_D$	0.83	A
		0.52	A
Pulsed Drain Current <sup>(1)</sup>	$I_{DM}$	3.3	A
Power Dissipation	$P_D$	2.5	W
		0.02	W/ $^\circ C$
Peak Diode Recovery $dv/dt$ <sup>(3)</sup>	$dv/dt$	5.5	V/ns
Repetitive Pulse Avalanche Energy <sup>(4)</sup>	$E_{AR}$	0.25	mJ
Avalanche current <sup>(1)</sup>	$I_{AR}$	0.83	A
Single Pulse Avalanche Energy <sup>(4)</sup>	$E_{AS}$	52	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>	$R_{\theta JA}$	50	$^\circ C/W$

\*When mounted on the minimum pad size recommended (PCB Mount)

## Ordering Information

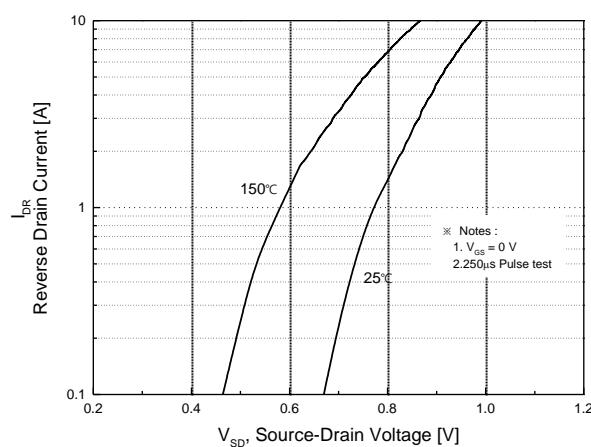
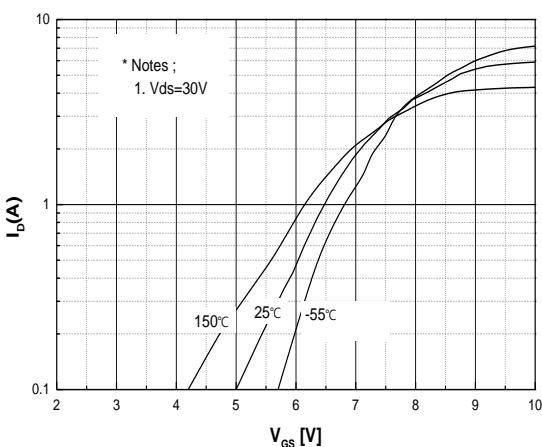
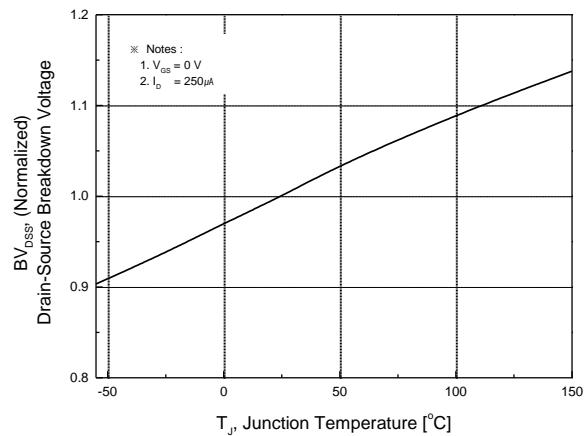
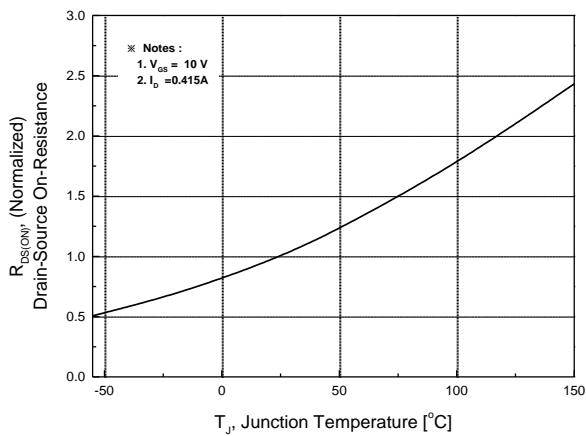
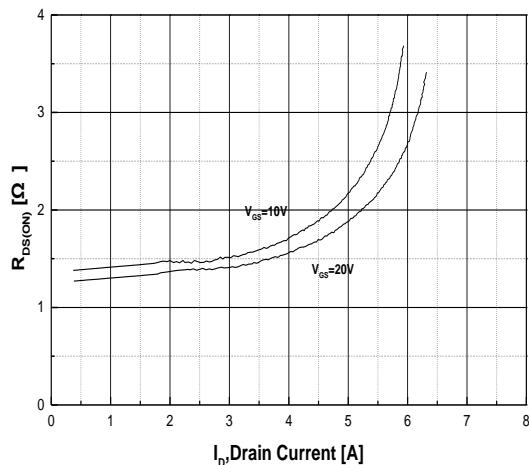
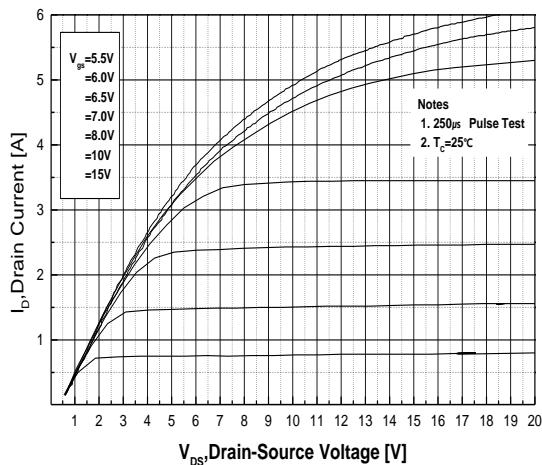
Part Number	Temp. Range	Package	Packing	RoHS Status
MDHT4N25URH	-55~150°C	SOT-223	Reel and Tape	Halogen Free

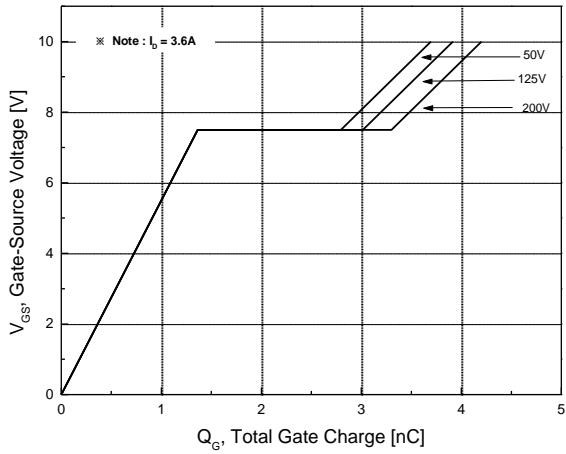
## Electrical Characteristics (Ta =25°C)

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	I <sub>D</sub> = 250μA, V <sub>GS</sub> = 0V	250	-	-	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> = 250V, 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>DS(ON)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 0.415A		1.38	1.75	Ω
Forward Transconductance	g <sub>fs</sub>	V <sub>DS</sub> = 30V, I <sub>D</sub> = 0.415A	-	0.91	-	S
<b>Dynamic Characteristics</b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = 200V, I <sub>D</sub> = 3.6A, V <sub>GS</sub> = 10V	-	4.2	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	1.35	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	1.95	-	
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 25V, V <sub>GS</sub> = 0V, f = 1.0MHz	-	146	-	pF
Reverse Transfer Capacitance	C <sub>rss</sub>		-	3	-	
Output Capacitance	C <sub>oss</sub>		-	32	-	
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>GS</sub> = 5V, V <sub>DS</sub> = 125V, I <sub>D</sub> = 3.6A, R <sub>G</sub> = 25Ω	-	8	-	ns
Rise Time	t <sub>r</sub>		-	21	-	
Turn-Off Delay Time	t <sub>d(off)</sub>		-	5	-	
Fall Time	t <sub>f</sub>		-	16	-	
<b>Drain-Source Body Diode Characteristics</b>						
Maximum Continuous Drain to Source Diode Forward Current	I <sub>S</sub>	I <sub>F</sub> = 3.6A, dI/dt = 100A/μs <sup>(3)</sup>	-	0.83	-	A
Source-Drain Diode Forward Voltage	V <sub>SD</sub>		-	-	1.5	V
Body Diode Reverse Recovery Time	t <sub>rr</sub>		-	110	-	ns
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>		-	0.34	-	μC

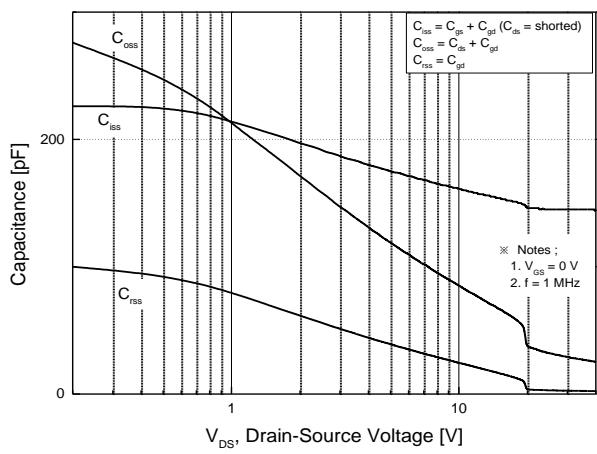
Note :

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>≤3.6A, di/dt≤300A/us, V<sub>DD</sub>≤BV<sub>DSS</sub>, R<sub>g</sub> =25Ω, Starting T<sub>J</sub>=25°C
4. L=120mH, I<sub>AS</sub>=0.83A, V<sub>DD</sub>=50V, R<sub>g</sub> =25Ω, Starting T<sub>J</sub>=25°C

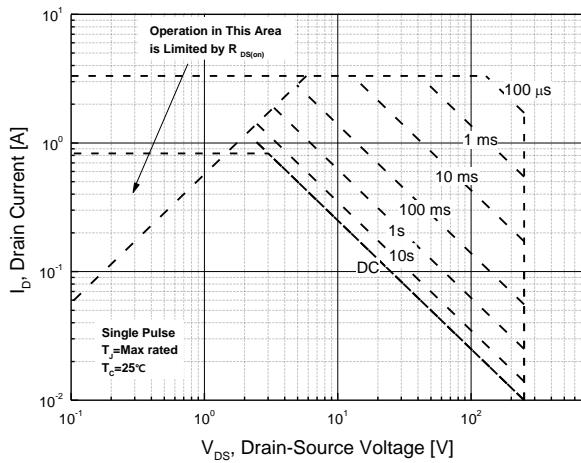




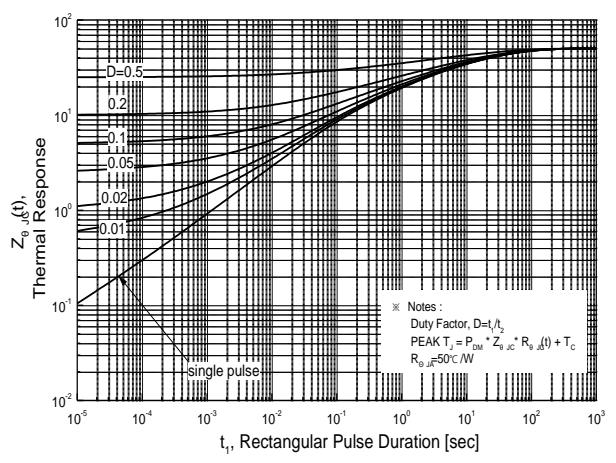
**Fig.7 Gate Charge Characteristics**



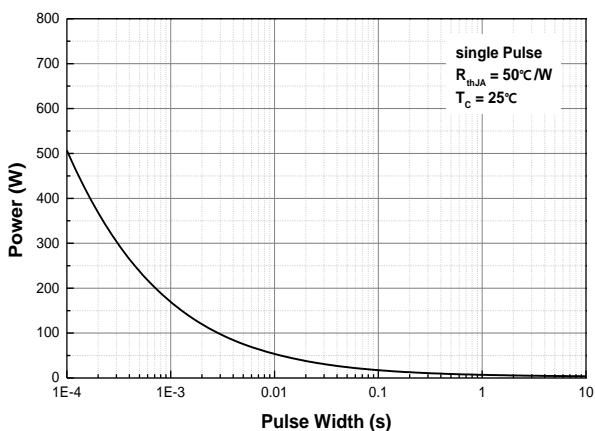
**Fig.8 Capacitance Characteristics**



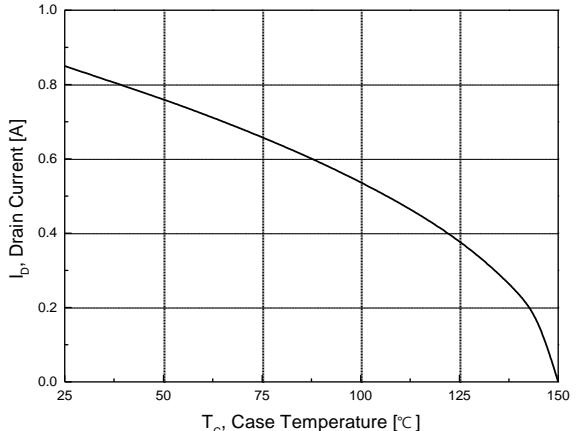
**Fig.9 Maximum Safe Operating Area**



**Fig.10 Transient Thermal Response Curve**



**Fig.11 Single Pulse Maximum Power Dissipation**

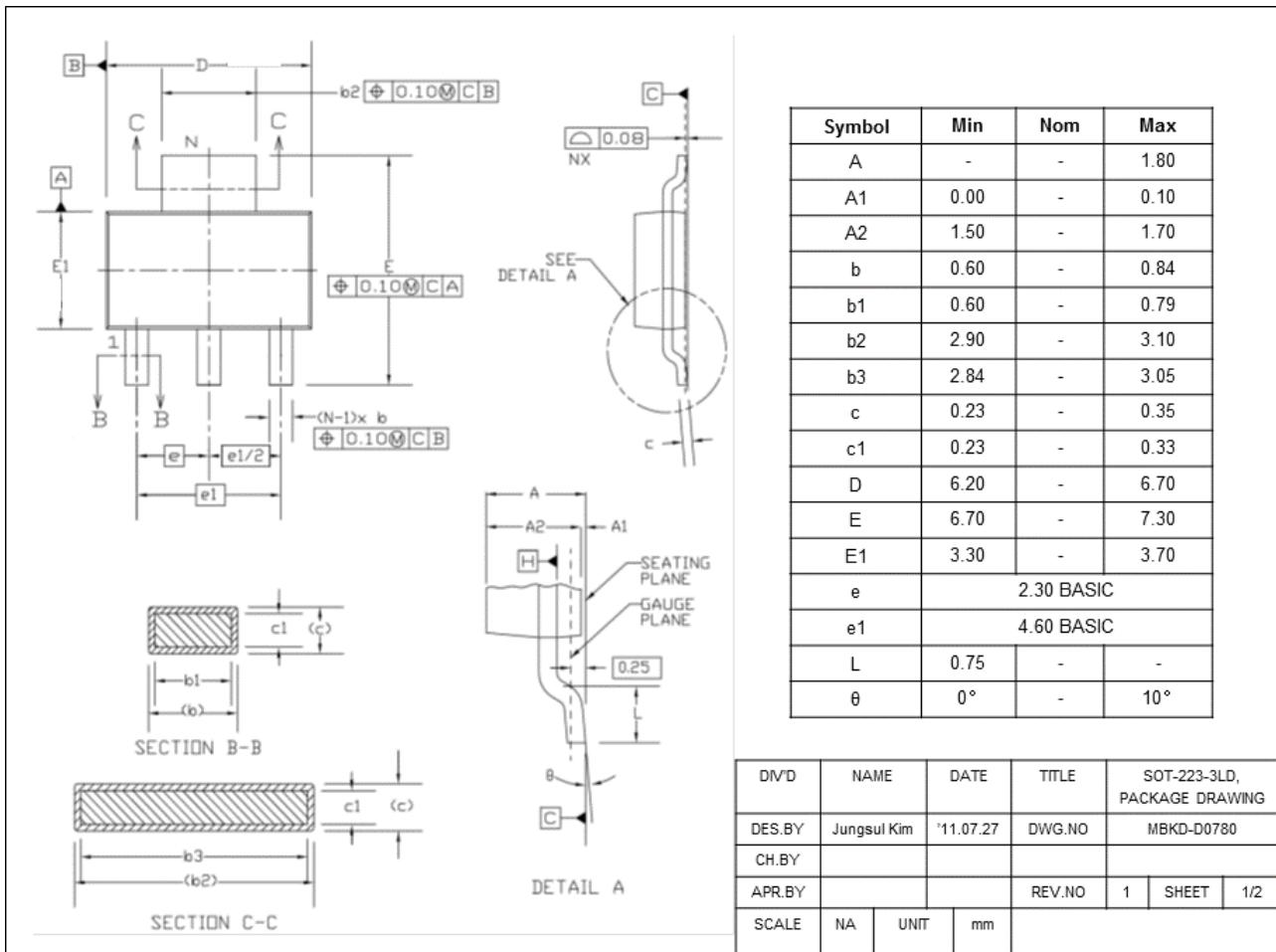


**Fig.12 Maximum Drain Current vs. Case Temperature**

## Physical Dimension

### SOT-223

Dimensions are in millimeters, unless otherwise specified



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

**DISCLAIMER:**

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