



MDT08N017RH

Single N-channel Trench MOSFET 80V 1.7mΩ 300A

General description

The MDT08N017RH uses advanced MagnaChip's MOSFET Technology, which provides high performance in on-state resistance, fast switching performance, and excellent quality.

These devices can also be utilized in industrial applications such as high power drives of E-Vehicles(E-bike), DC/DC converter and BMS, general purpose applications.

Features and benefits

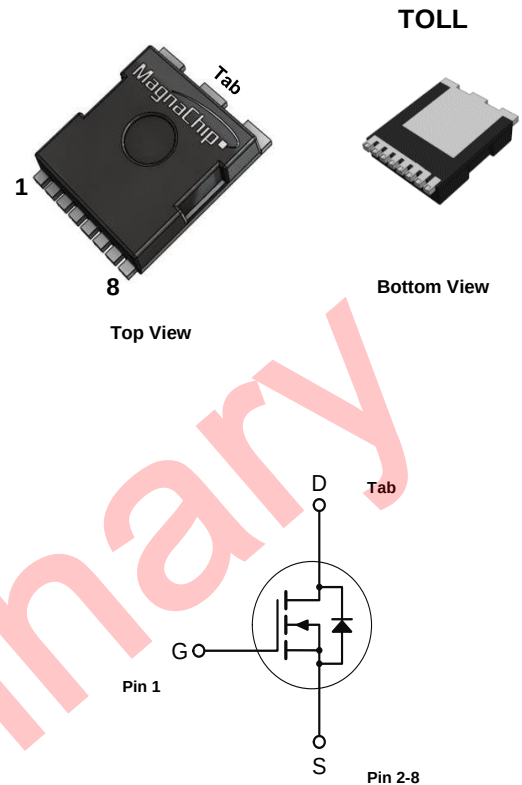
- MagnaChip's MOSFET Technology
- Very low on-resistance $R_{DS(on)}$
- 100% Avalanche / Rg / ΔV_{DS} Tested

Applications

- Motor Inverter
- Battery Management
- Power Inverter

Key performance parameters

V_{DS}	80	V
$R_{DS(on), max}$	0.0017	Ω
I_D	300	A
Q_G	166	nC
Junction temperature, max	175	$^{\circ}C$



Ordering information

Type / Ordering Code	Package	Marking	Packing	RoHS Status
MDT08N017RH	TOLL	MDT08N017	Tape & Reel	Halogen Free

<http://www.magnachip.com/powersolutions>



Maximum ratings, at $T_A = 25^\circ\text{C}$, unless otherwise specified

Parameter		Symbol	Rating	Unit
Drain-source Voltage		V_{DS}	80	V
Gate-source Voltage		V_{GS}	± 20	V
¹⁾ Drain current	$T_C=25^\circ\text{C}$ Silicon Limited	I_D	332	A
	$T_C=25^\circ\text{C}$ Package Limited		300	A
	$T_C=100^\circ\text{C}$ Silicon Limited		235	A
Pulsed drain current	$T_C=25^\circ\text{C}$	I_{DM}	1200	V
Total power dissipation	$T_C=25^\circ\text{C}$	P_{tot}	375	W
	$T_C=100^\circ\text{C}$		188	W
³⁾ Avalanche energy, single pulse		E_{AS}	800	mJ
Operating and storage temperature		T_j, T_{stg}	- 55 ~ 175	$^\circ\text{C}$

Thermal characteristics

Parameter	Symbol	Rating	Unit
¹⁾ Thermal resistance, junction - case	$R_{\theta JC}$	0.4	K/W
Thermal resistance, junction - ambient	$R_{\theta JA}$	40	K/W

Notes

1. Surface mounted FR-4 board by JEDEC (jesd51-7)
2. Pulse width limited by T_{jmax}
3. EAS is tested at starting $T_j = 25^\circ\text{C}$, $L = 1.0\text{mH}$, $I_{AS} = 40\text{A}$, $V_{DD} = 50\text{V}$, $V_{GS} = 10\text{V}$

Electrical Characteristics ($T_J = 25^\circ\text{C}$)**Static characteristics**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions / Note
Drain-source breakdown voltage	$V_{(BR)DSS}$	80	-	-	V	$V_{GS}=0\text{ V}$, $I_D=250\text{ }\mu\text{A}$
Gate threshold voltage	$V_{GS(th)}$	2.4		3.8	V	$V_{DS}=V_{GS}$, $I_D=250\text{ }\mu\text{A}$
Zero gate voltage drain current	I_{DSS}	-	-	1	μA	$V_{DS}=80\text{ V}$, $V_{GS}=0\text{ V}$
Gate-source leakage current	I_{GSS}	-	-	± 100	nA	$V_{GS}=\pm 20\text{ V}$, $V_{DS}=0\text{ V}$
Drain-source on-state resistance	$R_{DS(on)}$	-	-	1.7	m Ω	$V_{GS}=10\text{ V}$, $I_D=100\text{ A}$
Gate resistance	R_G	-	3.3	-	Ω	f=1MHz
Transconductance	g_{fs}	-	120	-	S	$V_{DS}=10\text{ V}$, $I_D=100\text{ A}$

Dynamic characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions / Note
Input capacitance	C_{iss}	-	12,025	-	pF	$V_{GS}=0\text{ V}$, $V_{DS}=40\text{ V}$, f=1 MHz
Output capacitance	C_{oss}	-	2,634	-	pF	$V_{GS}=0\text{ V}$, $V_{DS}=40\text{ V}$, f=1 MHz
Reverse transfer capacitance	C_{rss}	-	40	-	pF	$V_{GS}=0\text{ V}$, $V_{DS}=40\text{ V}$, f=1 MHz
Turn-on delay time	$t_{d(on)}$	-	34	-	ns	$V_{DD}=40\text{ V}$, $V_{GS}=10\text{ V}$, $I_D=100\text{ A}$, $R_{G,ext}=3\Omega$
Rise time	t_r	-	25	-	ns	$V_{DD}=40\text{ V}$, $V_{GS}=10\text{ V}$, $I_D=100\text{ A}$, $R_{G,ext}=3\Omega$
Turn-off delay time	$t_{d(off)}$	-	128	-	ns	$V_{DD}=40\text{ V}$, $V_{GS}=10\text{ V}$, $I_D=100\text{ A}$, $R_{G,ext}=3\Omega$
Fall time	t_f	-	60	-	ns	$V_{DD}=40\text{ V}$, $V_{GS}=10\text{ V}$, $I_D=100\text{ A}$, $R_{G,ext}=3\Omega$

Gate charge characteristics

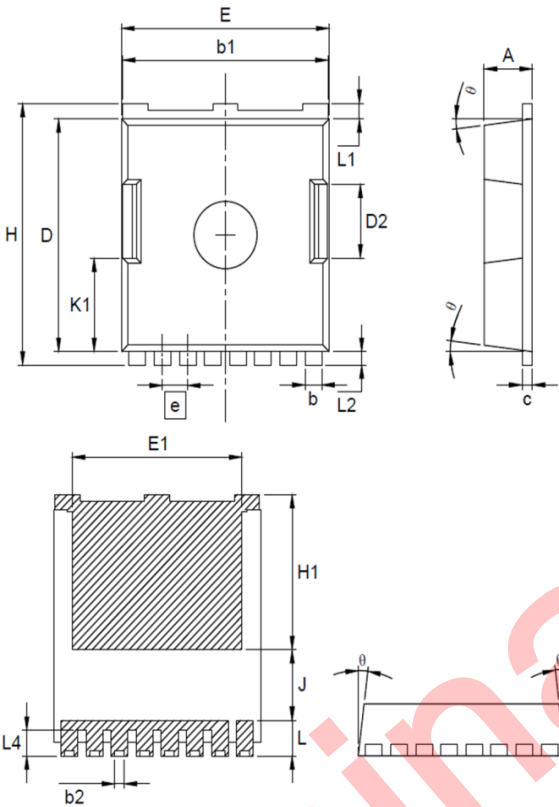
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions / Note
Gate to source charge	Q_{gs}	-	42	-	nC	$V_{DD}=40\text{ V}$, $I_D=100\text{ A}$, $V_{GS}=0\text{ to }10\text{ V}$
Gate charge at threshold	$Q_{gs(th)}$	-	32	-	nC	$V_{DD}=40\text{ V}$, $I_D=100\text{ A}$, $V_{GS}=0\text{ to }10\text{ V}$
Gate to drain charge	Q_{gd}	-	38	-	nC	$V_{DD}=40\text{ V}$, $I_D=100\text{ A}$, $V_{GS}=0\text{ to }10\text{ V}$
Switching charge	Q_{sw}	-	48	-	nC	$V_{DD}=40\text{ V}$, $I_D=100\text{ A}$, $V_{GS}=0\text{ to }10\text{ V}$
Gate charge total	Q_g	-	166	-	nC	$V_{DD}=40\text{ V}$, $I_D=100\text{ A}$, $V_{GS}=0\text{ to }10\text{ V}$
Gate plateau voltage	$V_{plateau}$	-	4.4	-	V	$V_{DD}=40\text{ V}$, $I_D=100\text{ A}$, $V_{GS}=0\text{ to }10\text{ V}$

Source-drain diode

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions / Note
Diode continuous forward current	I_S	-	-	300	A	-
Diode pulse current	$I_{S,pulse}$	-	-	1200	A	pulsed; $t_p \leq 10\text{ }\mu\text{s}$
Diode forward voltage	V_{SD}	-	1.0	1.2	V	$V_{GS}=0\text{ V}$, $I_F=100\text{ A}$
Reverse recovery time	t_{rr}	-	136	-	ns	$I_F=100\text{ A}$, $dI_F/dt=100\text{ A}/\mu\text{s}$
Reverse recovery charge	Q_{rr}	-	454	-	nC	$I_F=100\text{ A}$, $dI_F/dt=100\text{ A}/\mu\text{s}$

Package information

TOLL



Symbol	Dimension (mm)		
	Min	Nom	Max
A	2,20	–	2,40
b	0,70	–	0,90
b1	9,70	–	9,90
b2	0,42	–	0,50
c	0,40	–	0,60
D	10,28	–	10,58
D2	3,10	3,30	3,50
E	9,70	9,90	10,10
E1	7,90	8,10	8,30
e	BSC 1,20		
H	11,48	11,68	11,90
H1	BSC 6,95		
J	BSC 3,15		
K1	3,98	4,18	4,38
L	1,38	1,60	1,80
L1	0,60	0,70	0,80
L2	0,50	0,60	0,70
L4	1,00	1,15	1,30
θ	4°	7°	10°

Preliminary

DISCLAIMER :

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