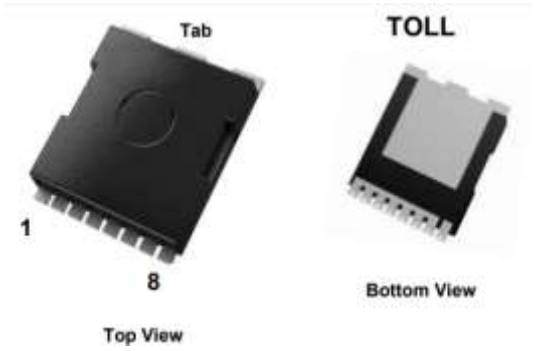
General Description

EMDT08N017RH uses 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.

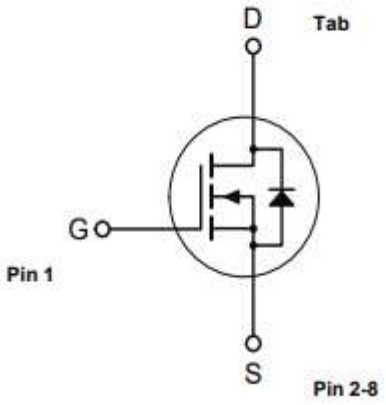
Features and benefits

- Very low on-resistance RDS(on)
- 100% Avalanche / Rg / △VDS 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	183	nC
Junction temperature, max	175	°C

Ordering information

Type / Ordering Code	Package	Marking	Packing	RoHS Status
EMDT08N017RH	TOLL	MDT08N017	Tape & Reel	Halogen Free

Maximum Ratings

T_A = 25°C, unless otherwise specified

Drain-source Voltage		V_{DS}	80	V
Gate-source Voltage		V_{GS}	± 20	V
Drain current	Tc=25°C Silicon Limited	I_D	340	A
	Tc=25°C Package Limited		300	A
	Tc=100°C Silicon Limited		240	A
1) Pulsed drain current	Tc=25°C	I_{DM}	1200	A
Total power dissipation	Tc=25°C	P_{tot}	469	W
	Tc=100°C		234	W
2) Avalanche energy, single pulse		E_{AS}	578	mJ
Operating and storage temperature		T_j, T_{stg}	- 55 ~ 175	°C

Thermal characteristics

Thermal resistance, junction - case	$R_{\theta JC}$	0.32	K/W
3) Thermal resistance, junction - ambient	$R_{\theta JA}$	40	K/W

Notes

1. Pulse width limited by Tjmax
2. EAS is tested at starting Tj = 25℃, L = 1.0mH, IAS = 34A, VDD = 50V, VGS = 10V
3. Surface mounted FR-4 board by JEDEC (jesd51-7)

Electrical Characteristics (T_J = 25°C)

Static characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions / Note
Drain-source breakdown voltage	$V_{(BR)DSS}$	80	-	-	V	V_{GS}=0 V, I_D=250 μA
Gate threshold voltage	$V_{GS(th)}$	2.4	3.1	3.8	V	V_{DS}=VGS, I_D=250 μA
Zero gate voltage drain current	I_{DSS}	-	-	1	μA	V_{DS}=80 V, V_{GS}=0 V
Gate-source leakage current	I_{GSS}	-	-	± 100	nA	V_{GS}=±20 V, V_{DS}=0 V
Drain-source on-state resistance	$R_{DS(on)}$	-	1.3	1.7	mΩ	V_{GS}=10 V, I_D=100 A
Gate resistance	R_G	-	3.0	-	Ω	f=1MHz
Transconductance	g_{fs}	-	120	-	S	V_{DS}=10 V, I_D=100 A

Dynamic characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions / Note
Input capacitance	C_{iss}	-	12,684	-	pF	V_{GS}=0 V, V_{DS}=40 V, f=1 MHz
Output capacitance	C_{oss}	-	2,338	-	pF	V_{GS}=0 V, V_{DS}=40 V, f=1 MHz
Reverse transfer capacitance	C_{rss}	-	65	-	pF	V_{GS}=0 V, V_{DS}=40 V, f=1 MHz
Turn-on delay time	$t_{d(on)}$	-	35	-	ns	V_{DD}=40 V, V_{GS}=10 V, ID=100 A, $R_{G,ext}$=3Ω
Rise time	t_r	-	27	-	ns	V_{DD}=40 V, V_{GS}=10 V, ID=100 A, $R_{G,ext}$=3Ω
Turn-off delay time	$t_{d(off)}$	-	132	-	ns	V_{DD}=40 V, V_{GS}=10 V, ID=100 A, $R_{G,ext}$=3Ω
Fall time	t_f	-	67	-	ns	V_{DD}=40 V, V_{GS}=10 V, ID=100 A, $R_{G,ext}$=3Ω

Gate charge characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions / Note
Gate to source charge	Q_{gs}	-	57	-	nC	V_{DD}=40 V, I_D=100 A, V_{GS}=0 to 10 V
Gate charge at threshold	$Q_{gs(th)}$	-	36	-	nC	V_{DD}=40 V, I_D=100 A, V_{GS}=0 to 10 V
Gate to drain charge	Q_{gd}	-	40	-	nC	V_{DD}=40 V, I_D=100 A, V_{GS}=0 to 10 V
Switching charge	Q_{sw}	-	61	-	nC	V_{DD}=40 V, I_D=100 A, V_{GS}=0 to 10 V
Gate charge total	Q_g	-	183	-	nC	V_{DD}=40 V, I_D=100 A, V_{GS}=0 to 10 V
Gate plateau voltage	$V_{plateau}$	-	4.7	-	V	V_{DD}=40 V, I_D=100 A, V_{GS}=0 to 10 V

Electrical characteristics diagrams

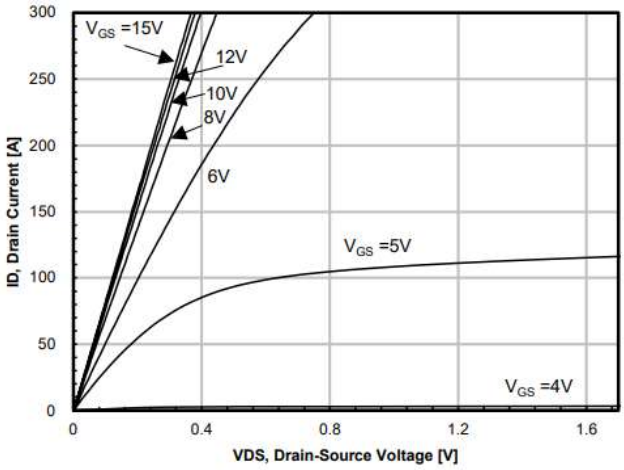


Fig. 1. On-Region Characteristics

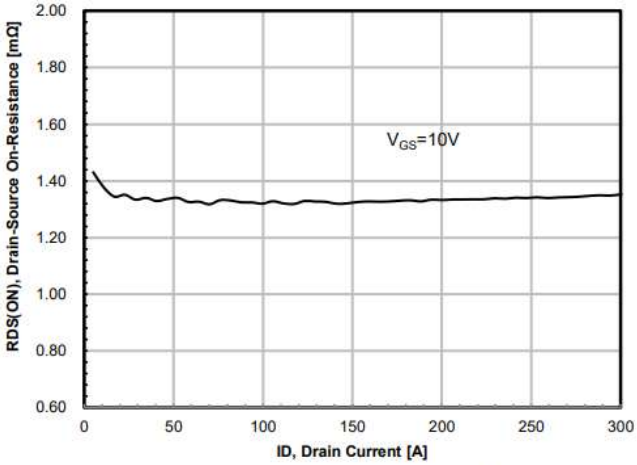


Fig. 2. On-Resistance vs. Drain Current and Gate Voltage

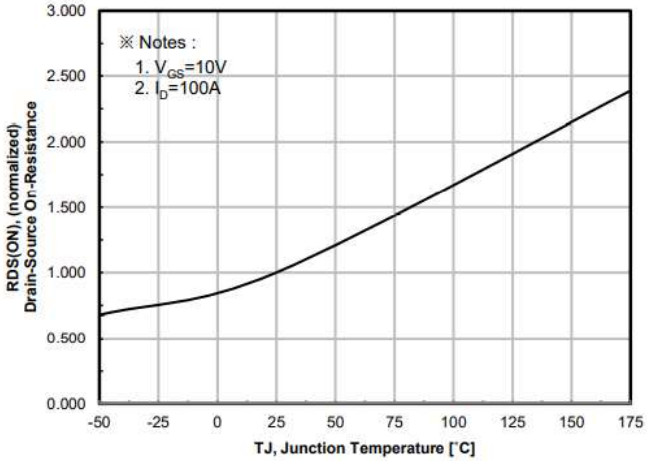


Fig. 3. On-Resistance vs. Junction Temperature

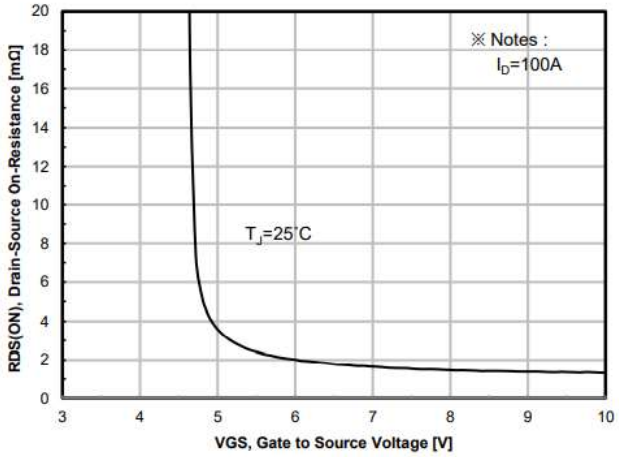


Fig. 4. On-Resistance vs. Gate to Source Voltage

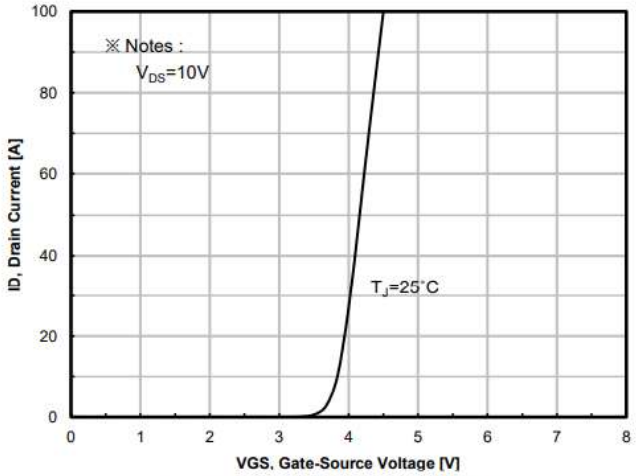


Fig. 5. Transfer Characteristics

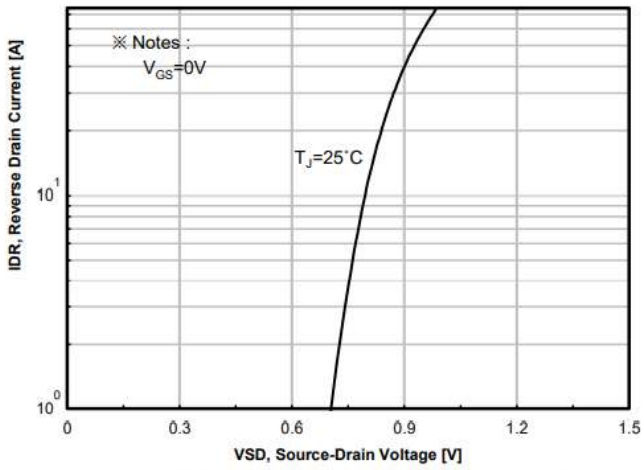


Fig. 6. Source-Drain Diode Forward Voltage

Electrical characteristics diagrams

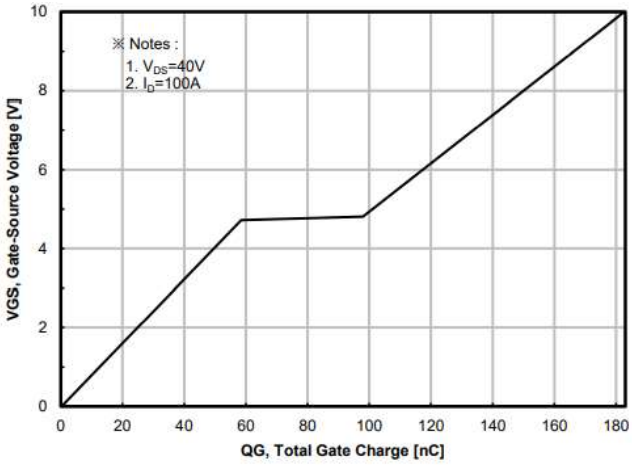


Fig. 7. Gate Charge

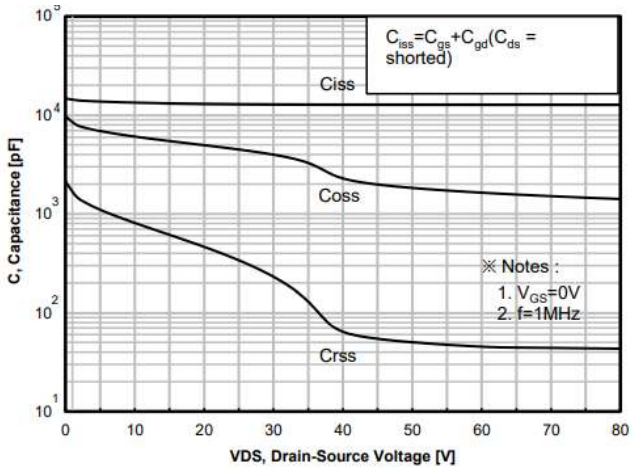


Fig. 8. Capacitance

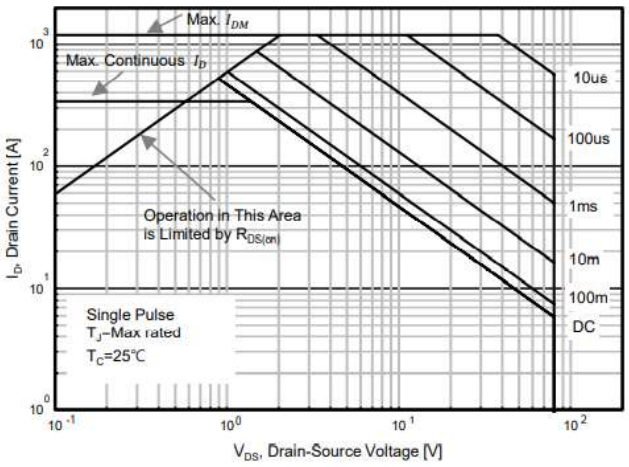


Fig. 9. Safe Operating Area, Junction-to-Ambient

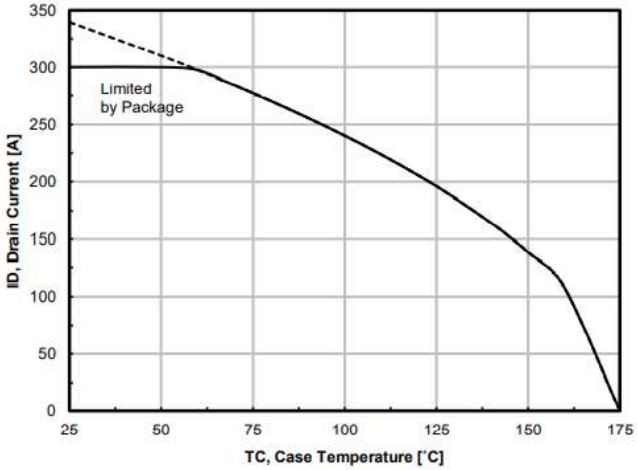


Fig. 10. Maximum Drain vs. Case Temperature

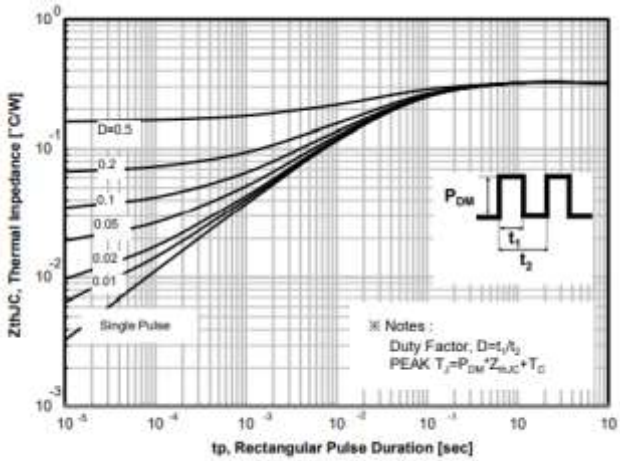
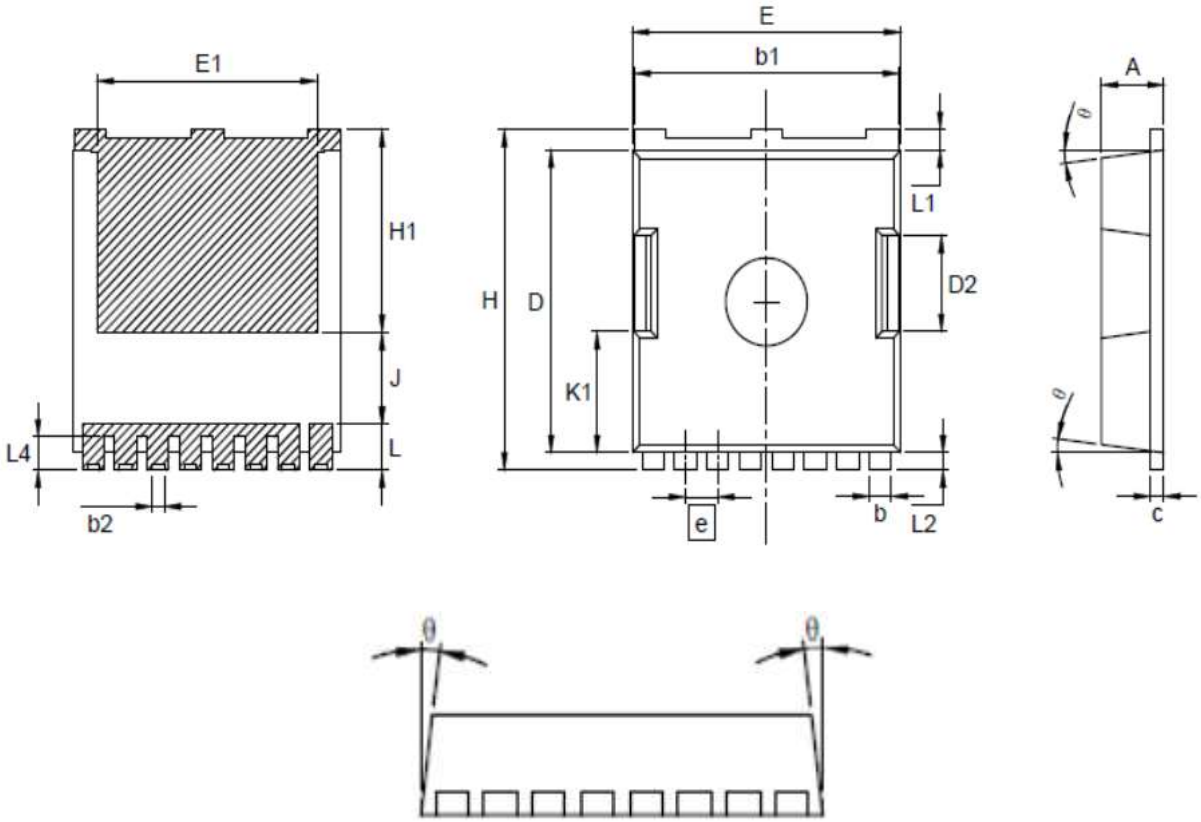


Fig. 11. Thermal Transient Impedance, Junction-to-Ambient

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	0.37	-	0.50
c	0.40	-	0.60
D	10.28	-	10.58
D2	3.10	-	3.65
E	9.70	9.90	10.10
E1	7.70	8.00	8.30
e	BSC 1.20		
H	11.48	11.68	11.90
H1	6.75	-	7.15
J	2.80	-	3.30
K1	3.98	4.18	4.38
L	1.38	1.60	1.98
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°