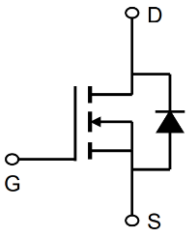
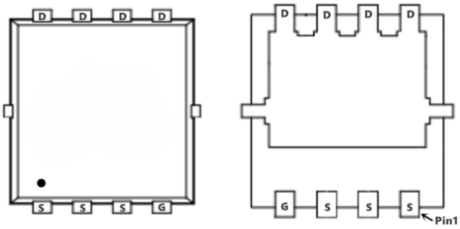
LM3D40N10

100V N-Channel Enhancement Mode MOSFET

Description

The LM3D40N10 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.





General Features

V_{DS} = 100V I_D =40A

$R_{DS(ON)}$ < 25mΩ @ V_{GS}=10V （Typ. 14mΩ）

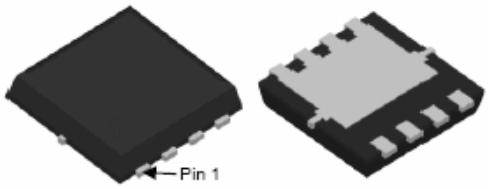
Application

Consumer electronic power supply

Motor control

Synchronous-rectification

Isolated DC



Package Marking and Ordering Information

Device	Device Marking	Device Package	Reel Size	Tape width	Quantity
LM3D40N10	AON7296	DFN3.3X3.3	-	-	5000 units

Absolute Maximum Ratings (T_C=25℃unless otherwise noted)

Symbol	Parameter	Rating	Units
VDS	Drain source voltage	100	V
VGS	Gate source voltage	±20	V
ID	Continuous drain current[1], T_C=25 ℃	40	A
ID, pulse	Pulsed drain current[2], T_C=25 ℃	120	A
P_D	Power dissipation[3], T_C=25 ℃	71	W
EAS	Single pulsed avalanche energy[5]	57	mJ
Tstg，Tj	Operation and storage temperature	-55 to 150	℃
RθJC	Thermal resistance, junction-case	1.76	℃/W
RθJA	Thermal resistance, junction-ambient[4]	62	°C/W

Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Symbol	Parameter	Test condition	Min.	Typ.	Max.	Unit
BVDSS	Drain-source breakdown voltage	V_{GS}=0 V, I_D=250 μA	100	107		V
VGS(th)	Gate threshold voltage	V_{DS}=V_{GS}, I_D=250 μA	1.2	1.5	2.5	V
RDS(ON)	Drain-source on-state resistance	V_{GS}=10 V, I_D=10 A		14	25.0	mΩ
RDS(ON)	Drain-source on-state resistance	V_{GS}=4.5 V, I_D=7 A		18	30.0	mΩ
IGSS	Gate-source leakage current	V_{GS}=±20 V			±100	nA
IDSS	Drain-source leakage current	V_{DS}=100 V, V_{GS}=0 V			1	uA
Ciss	Input capacitance	V_{GS}=0 V, V_{DS}=50 V, f=100 kHz		1003.9		pF
Coss	Output capacitance			185.4		pF
Crss	Reverse transfer capacitance			9.8		pF
td(on)	Turn-on delay time	V_{GS}=10 V, V_{DS}=50 V, R_G=10 Ω, I_D=5 A		16.6		ns
t_r	Rise time			3.8		ns
td(off)	Turn-off delay time			75.5		ns
t_f	Fall time			46		ns
Q_g	Total gate charge	I_D=5 A, V_{DS}=50V, V_{GS}=10V		16.2		nc
Q_{gs}	Gate-source charge			2.8		nc
Qgd	Gate-drain charge			4.1		nc
Vplateau	Gate plateau voltage			3		V
I_S	Diode forward current	VGS<Vth		30		A
ISP	Pulsed source current			90		A
trr	Reverse recovery time	I_S=1A, di/dt=100 A/μs	49			ns
Q_{rr}	Reverse recovery charge		61.8			nc
Irrm	Peak reverse recovery current		2.4			A

Note :

1、Calculated continuous current based on maximum allowable junction temperature.

2、Repetitive rating; pulse width limited by max. junction temperature.

3、Pd is based on max. junction temperature, using junction-case thermal resistance.

4、The value of $R_{\Theta ja}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with T_a=25 °C.

5、V_{DD}=50 V, R_G=25 Ω, L=0.3 ㎜H, starting T_j=25 °C.

Typical Electrical and Thermal Characteristics

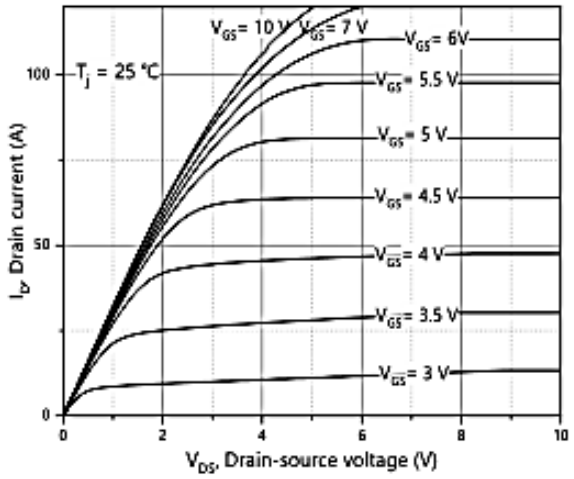


Figure 1, Typ. output characteristics

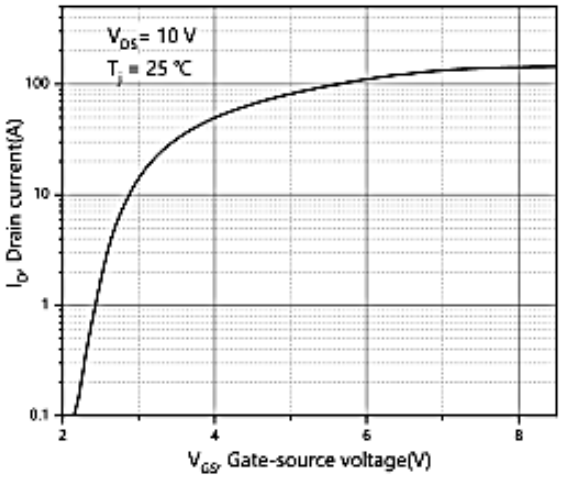


Figure 2, Typ. transfer characteristics

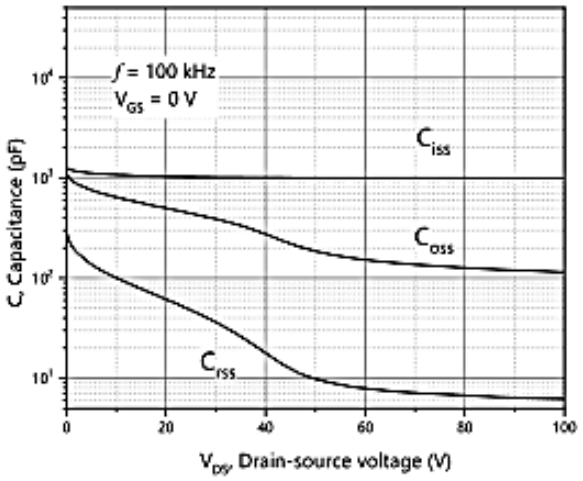


Figure 3, Typ. capacitances

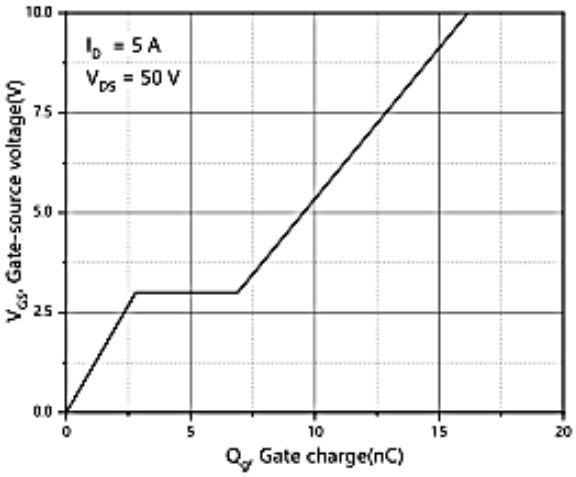


Figure 4, Typ. gate charge

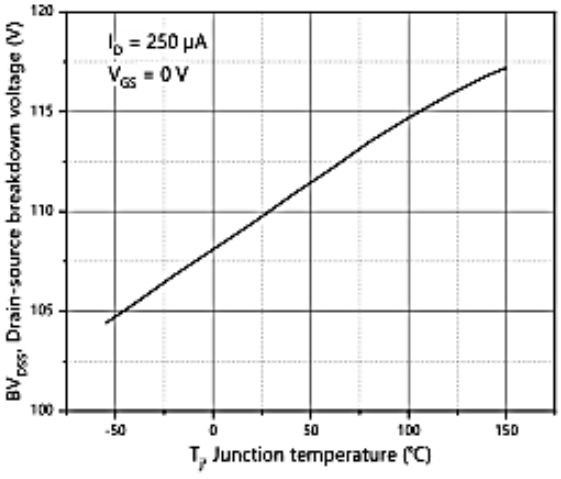


Figure 5, Drain-source breakdown voltage

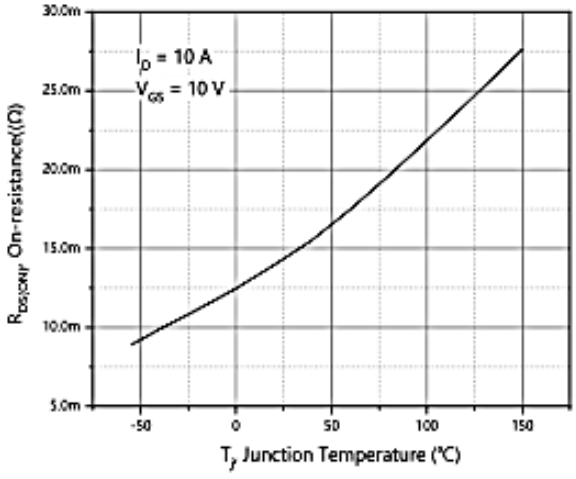


Figure 6, Drain-source on-state resistance

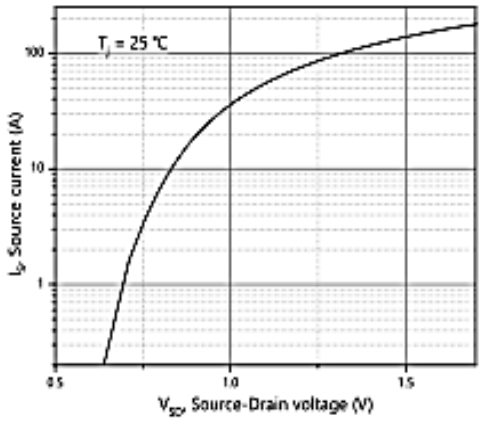


Figure 7, Forward characteristic of body diode

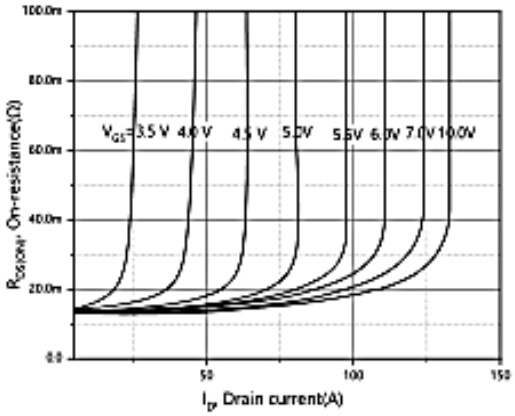


Figure 8, Drain-source on-state resistance

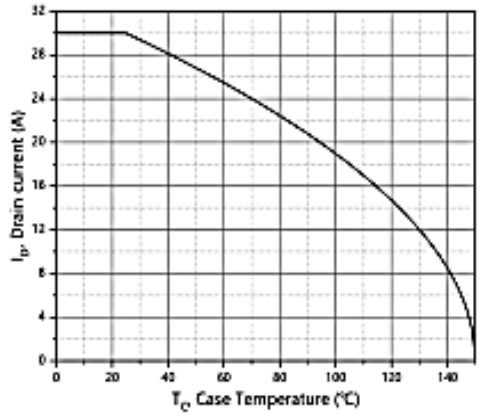


Figure 9, Drain current

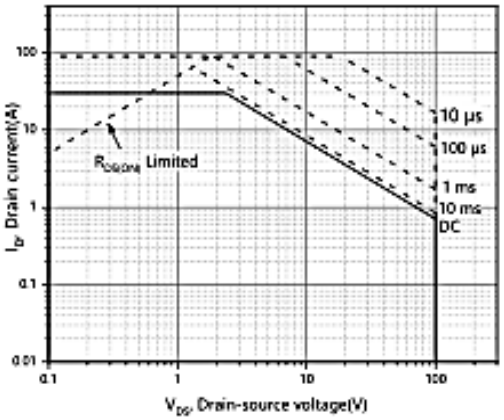
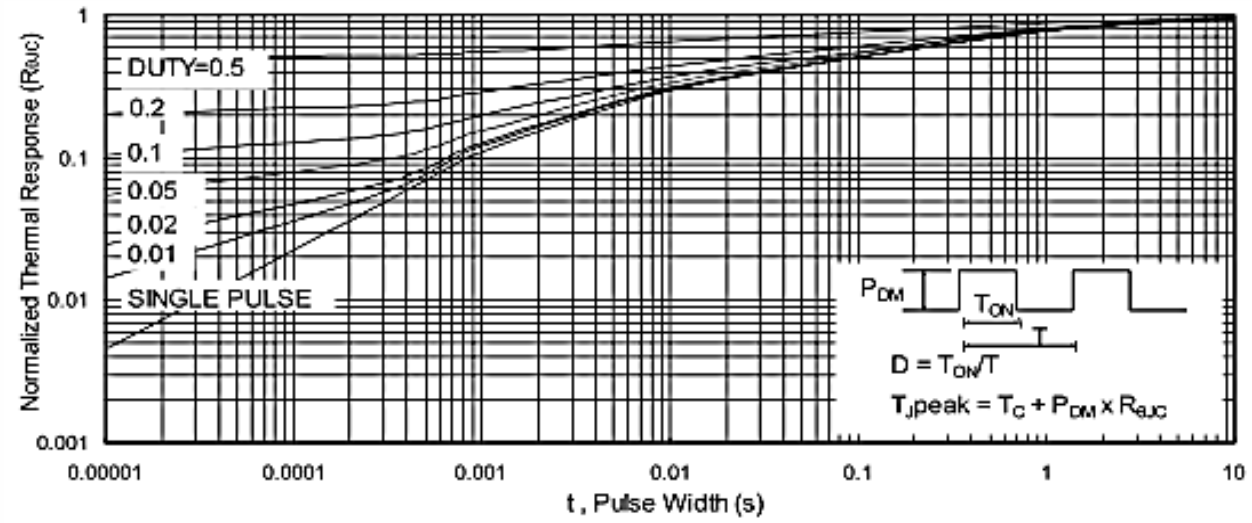
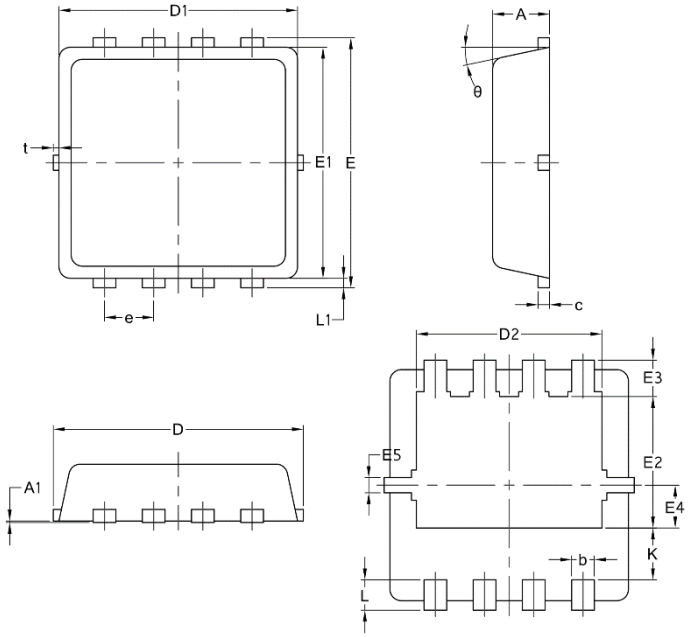


Figure 10, Safe operation area T_C=25 ℃



Figu11. Normalized Maximum Transient Thermal Impedance

Package DFN3.3x3.3



Symbol	Common		
	mm		
	Mim	Nom	Max
A	0.70	0.75	0.85
A1	/	/	0.05
b	0.20	0.30	0.40
c	0.10	0.152	0.25
D	3.15	3.30	3.45
D1	3.00	3.15	3.25
D2	2.29	2.45	2.65
E	3.15	3.30	3.45
E1	2.90	3.05	3.20
E2	1.54	1.74	1.94
E3	0.28	0.48	0.65
E4	0.37	0.57	0.77
E5	0.10	0.20	0.30
e	0.60	0.65	0.70
K	0.59	0.69	0.89
L	0.30	0.40	0.50
L1	0.06	0.125	0.20
t	0	0.075	0.13
Φ	10	12	14

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