Leiditech

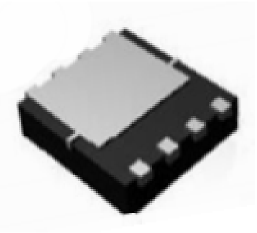
LM3D40P03

-30V P-Channel Enhancement Mode MOSFET

Description

The LM3D40P03 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.

Dimensions DFN3.3X3.3

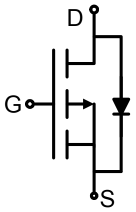


General Features

- V_{DS} = -30V I_D =-40A

$R_{DS(ON)}$ <16mΩ @ V_{GS}=-10V

Pin Configuration



Application

- Lithium battery protection
- Wireless impact
- Mobile phone fast charging

Package Marking and Ordering Information

Device	Device Marking	Device Package	Reel Size	Tape width	Quantity
LM3D40P03	AP40P03DF	DFN3.3X3.3	-	-	5000 units

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

Symbol	Parameter	Rating	Units
VDS	Drain-Source Voltage	-30	V
VGS	Gate-Source Voltage	±20	V
I_D@T_A=25℃	Continuous Drain Current, V_{GS} @ -10V[1]	-40	A
I_D@T_A=70℃	Continuous Drain Current, V_{GS} @ -10V[1]	-23	A
IDM	Pulsed Drain Current[2]	-120	A
EAS	Single Pulse Avalanche Energy[3]	68	mJ
IAS	Avalanche Current	-29.4	A
P_D@T_A=25℃	Total Power Dissipation[4]	3.1	W
P_D@T_A=70℃	Total Power Dissipation[4]	2	W
TSTG	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
$R_{\theta JA}$	Thermal Resistance Junction-Ambient [1]	75	℃/W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient [1](t≦ 10s)	40	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	24	℃/W

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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
V(BR)DSS	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D= -250μA	-30	-32.5	-	V
IDSS	Zero Gate Voltage Drain Current	V_{DS}= -30V, V_{GS}=0V,	-	-	-1	μA
IGSS	Gate to Body Leakage Current	V_{DS}=0V, V_{GS}= ±20V	-	-	±100	nA
VGS(th)	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D= -250μA	-1.2	-1.5	-2.5	V
RDS(on)	Static Drain-Source on-Resistance note3	V_{GS}= -10V, I_D= -10A	-	11	16	mΩ
		V_{GS}= -4.5V, I_D= -5A	-	16	20	
Rg	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	4.9	7.0	9.1	Ω
C_{iss}	Input Capacitance	V_{DS}= -24V, V_{GS}=10V, f=1.0MHz	-	2130	-	pF
Coss	Output Capacitance		-	280	-	pF
Crss	Reverse Transfer Capacitance		-	252	-	pF
Q_g	Total Gate Charge	V_{DS}= -24V, I_D= -1A, V_{GS}= -10V	-	22	-	nC
Q_{gs}	Gate-Source Charge		-	4	-	nC
Q_{gd}	Gate-Drain("Miller") Charge		-	5.8	-	nC
td(on)	Turn-on Delay Time	V_{DD}= -24V, I_D= -1A, V_{GS}= -10V, R_{GEN}=7.0Ω	-	9	-	ns
t_r	Turn-on Rise Time		-	13	-	ns
td(off)	Turn-off Delay Time		-	48	-	ns
t_f	Turn-off Fall Time		-	20	-	ns
IS	Maximum Continuous Drain to Source Diode Forward Current		-	-	-29.5	A
ISM	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-44	A
VSD	Drain to Source Diode Forward Voltage	V_{GS}=0V, I_S= -1A	-	-0.74	-1.2	V

Note :

1、The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.
2、The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
3、The power dissipation is limited by 150°C junction temperature
4、The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Electrical and Thermal Characteristics

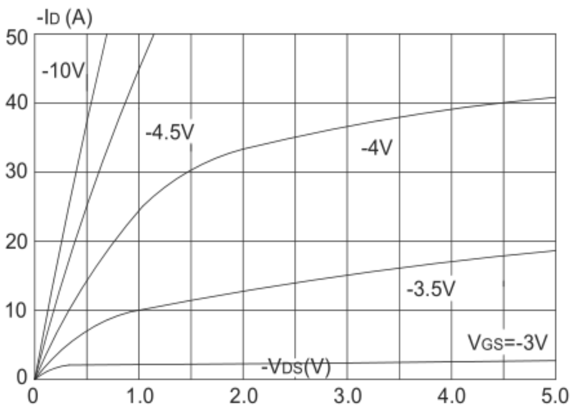


Figure1: Output Characteristics Figure

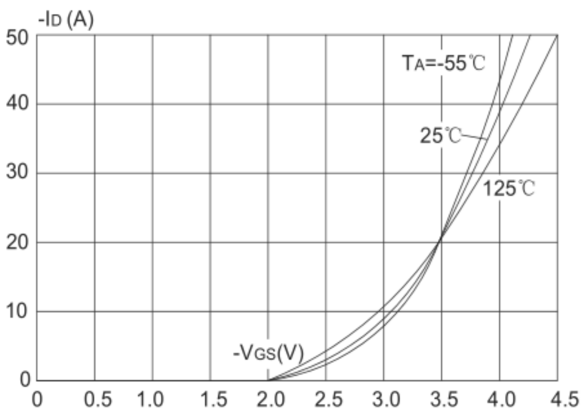


Figure2: Typical Transfer Characteristics

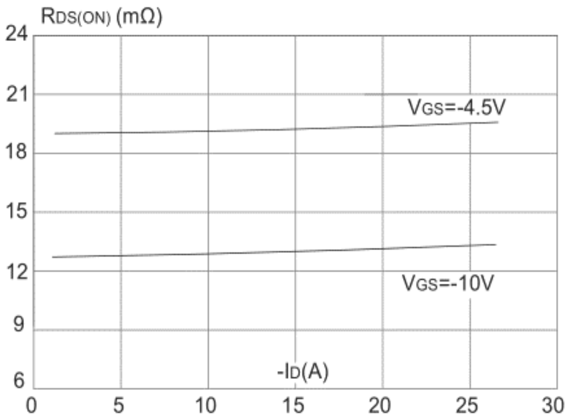


Figure 3:On-resistance vs. Drain Current

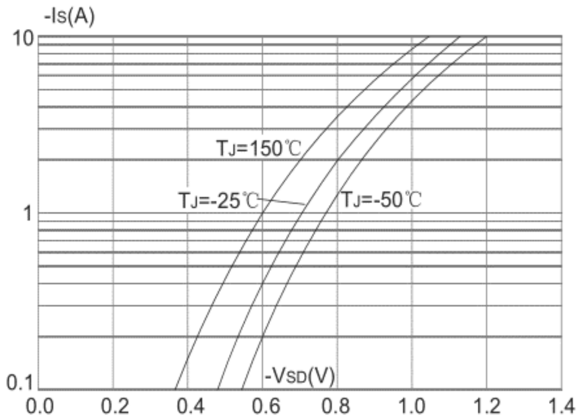


Figure 4: Body Diode Characteristics

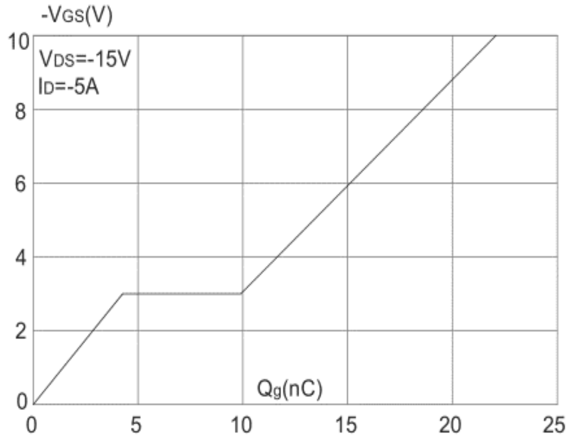


Figure 5: Gate Charge Characteristics

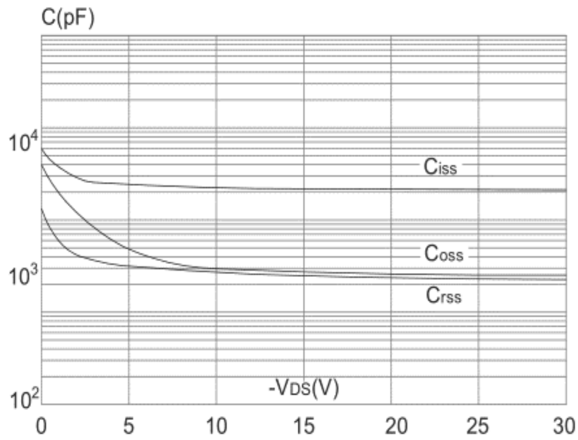


Figure 6: Capacitance Characteristics

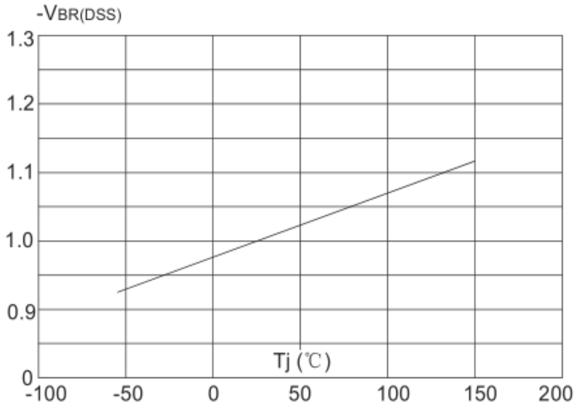


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

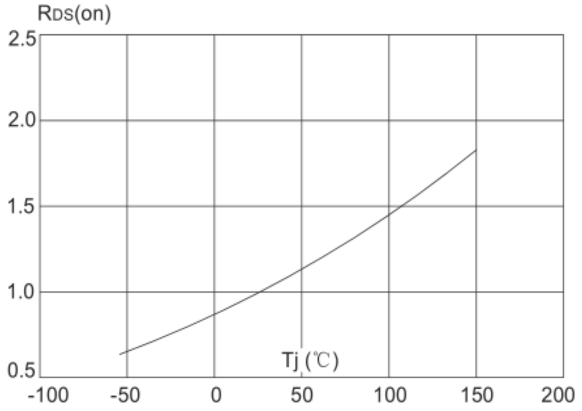


Figure 8: Normalized on Resistance vs. Junction Temperature

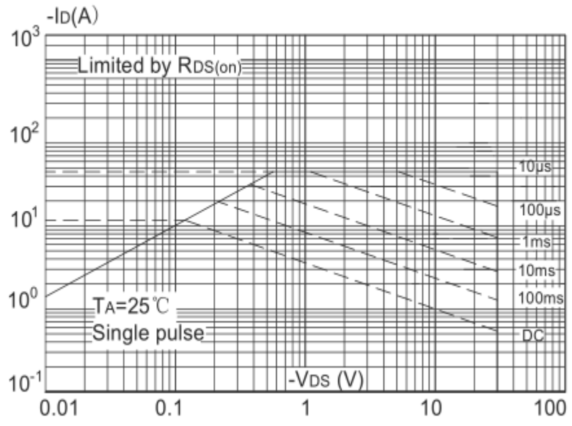


Figure 9: Maximum Safe Operating Area

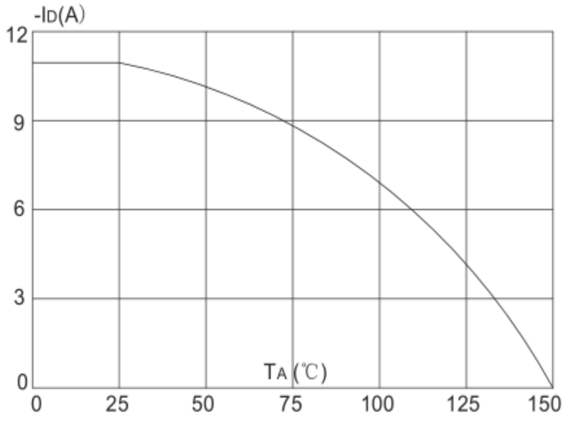


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

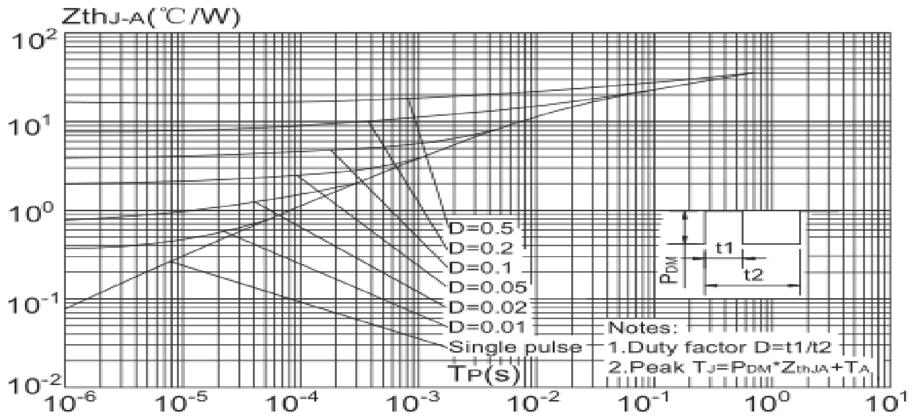
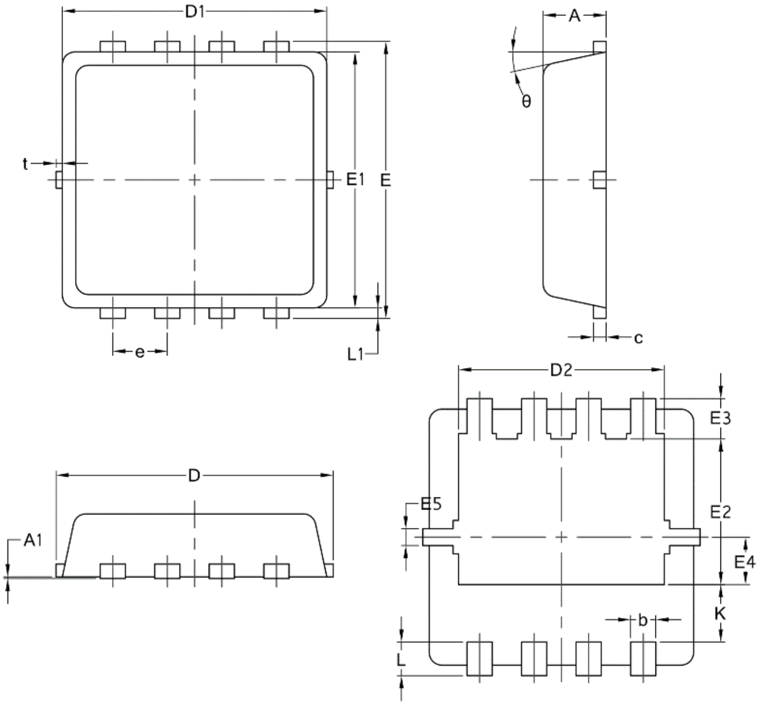


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

DFN3.3X3.3 EP Package Information



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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