40V N-Channel Enhancement Mode MOSFET

1.Product Information

1.1 Features

- ◇ Surface-mounted package
- ◇ Advanced SGT cell design
- ◇ Low Thermal Resistance

1.2 Applications

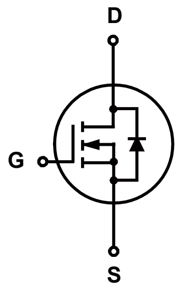
- ◇ Motor drivers
- ◇ DC - DC Converter

1.3 Quick reference

- ◇ BV ≧ 40 V
- ◇ P_{tot} ≦ 20.8 W
- ◇ I_D ≦ 52 A
- ◇ $R_{DS(ON)}$ ≦ 4.5mΩ @ V_{GS} = 10 V
- ◇ $R_{DS(ON)}$ ≦ 7.1mΩ @ V_{GS} = 4.5 V

2.Pin Description

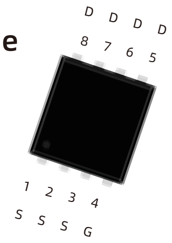
Symbol



Simplified Outline

Top View

PDFN3.3x3.3-8L



3.Marking Information

Product Name	Marking
LN042N040Q	**LN042N040Q** **CYWWZZ** **XXXXXX**

4.Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
V_{DS}	Drain-Source Voltage	T_C = 25 ℃	40	-	V
V_{GS}	Gate-Source Voltage	T_C = 25 ℃	-	± 20	V
I_D*	Drain Current (DC)	T_C = 25 ℃, V_{GS} = 10 V	-	52	A
		T_C = 100 ℃, V_{GS} = 10 V	-	33	A
I_{DM}*,**,***	Drain Current (Pulsed)	T_C = 25 ℃, V_{GS} = 10 V	-	144	A
P_{tot}	Total Power Dissipation	T_C = 25 ℃	-	20.8	W
T_{stg}	Storage Temperature		- 55	150	℃
T_J	Junction Temperature		-	150	℃
I_S	Diode Forward Current	T_C = 25 ℃	-	52	A
E_{AS}	Single Pulsed Avalanche Energy	V_{DD} = 40 V , L=1.0 mH	-	91	mJ
$R_{θJA}$*	Thermal Resistance- Junction to Ambient		-	62.5	℃/W
$R_{θJC}$*	Thermal Resistance- Junction to Case		-	6	

Notes：
* Surface Mounted on 1 in² pad area, t ≤10 sec
** Pulse width ≤300 μs, duty cycle ≤2 %
*** limited by bonding wire

5.Ordering Code

Product Name	Package	Reel Size	Tape width	Quantity	Note
LN042N040Q	**PDFN3.3*3.3**	**Ø330mm**	**12mm**	**5000**	

Note: COMTECH defines “ Green ” as lead-free (RoHS compliant) and halogen free (Br or Cl does not exceed 900 ppm by weight in homogeneous material and total of Br and Cl does not exceed 1500 ppm by weight;Follow IEC 61249-2-21 and IPC / JEDEC J-STD-020C)

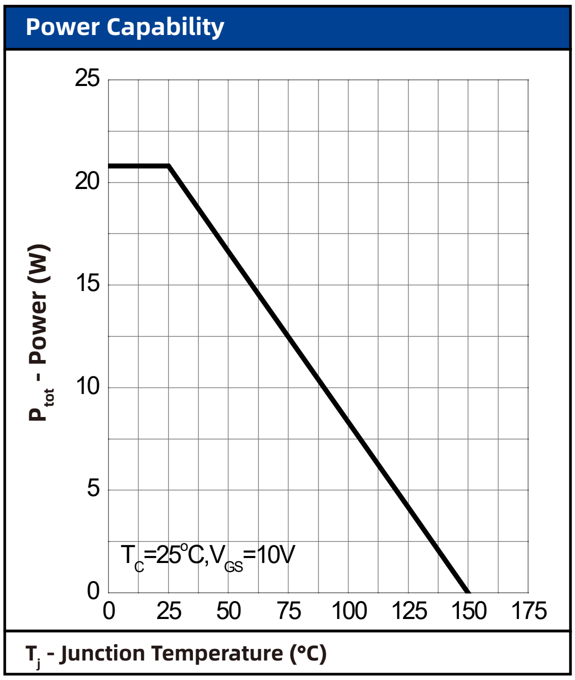
6. Electrical Characteristics (T_A=25 ° Unless Otherwise Noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0 V, I_{DS} = 250 μA	40	-	-	V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_{DS} = 250 μA	1	-	2	V
I_{DSS}	Zero Gate Voltage Source Current	V_{DS} = 32 V, V_{GS} = 0 V	-	-	1	μA
I_{GSS}	Gate Leakage Current	V_{DS} = 0 V, V_{GS}= ±20 V	-	-	± 100	nA
$R_{DS(ON)}{}^{a}$	Drain-Source On-State Resistance	V_{GS} = 10 V, I_{DS} = 15 A	-	4.0	4.5	mΩ
		V_{GS} = 4.5 V, I_{DS} = 10 A	-	6.3	7.1	
Diode Characteristics						
$V_{SD}{}^{a}$	Diode Forward Voltage	I_{SD} = 15 A, V_{GS} = 0 V	-	-	1.3	V
t_{rr}	Reverse Recovery Time	I_{SD} = 15 A	-	22	-	nS
Q_{rr}	Reverse Recovery Charge	dI_{SD}/dt = 100 A/μs	-	7.2	-	nC
Dynamic Characteristics^{b}						
C_{iSS}	Input Capacitance	V_{GS} = 0 V, V_{DS} = 20 V Frequency = 1 MHz	-	816	-	pF
C_{OSS}	Output Capacitance		-	248	-	
C_{rSS}	Reverse Transfer Capacitance		-	39	-	
t_d(on)	Turn-on Delay Time	V_{DS} = 20 V, V_{GEN} = 10 V, R_G = 3.9 Ω, R_L = 1.33 Ω, I_{DS} = 15 A	-	5.7	-	nS
t_r	Turn-on Rise Time		-	24	-	
t_d(off)	Turn-off Delay Time		-	24	-	
t_f	Turn-off Fall Time		-	18	-	
Gate Charge Characteristics^{b}					-	
Q_g	Total Gate Charge	V_{DS} = 20 V, V_{GS} = 10 V, I_{DS} = 15 A	-	21	-	nC
Q_{gs}	Gate-Source Charge		-	3.7	-	
Q_{gd}	Gate-Drain Charge		-	4.7	-	

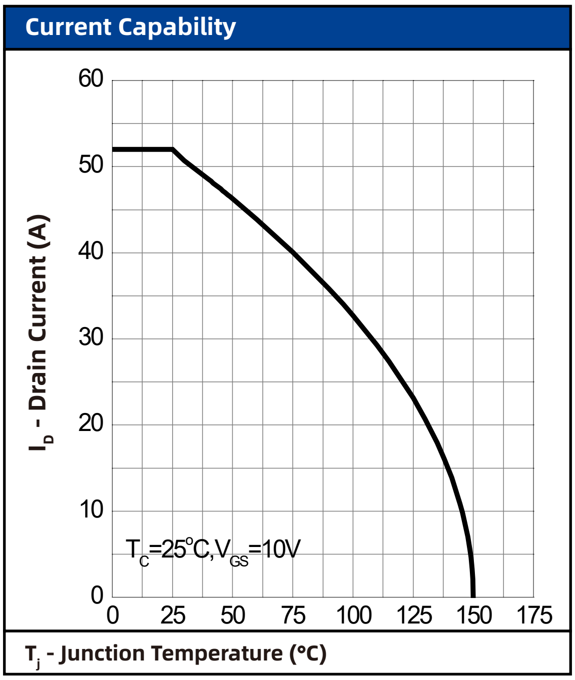
Notes :
a : Pulse test ; pulse width ≤ 300 μs, duty cycle ≤ 2%
b : Guaranteed by design, not subject to production testing

7. Typical Characteristics (cont.)

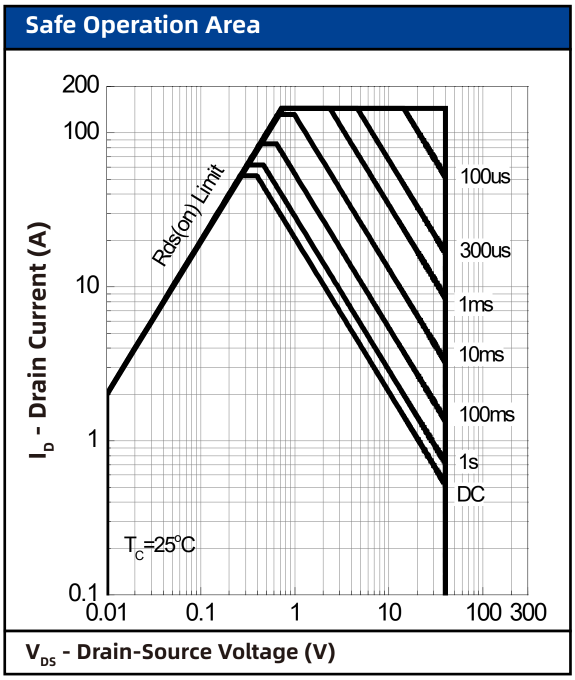
Power Capability



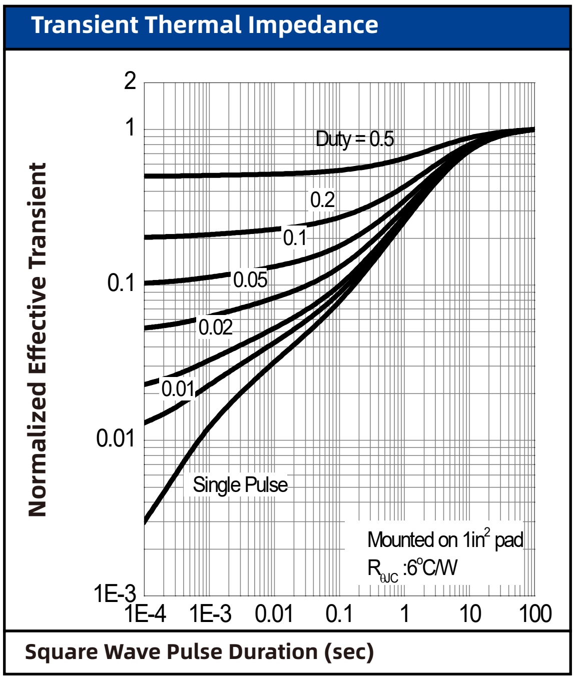
Current Capability



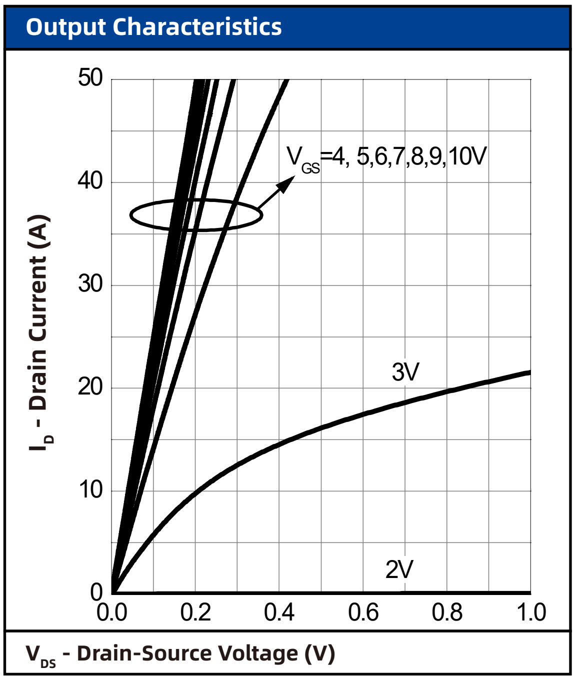
Safe Operation Area

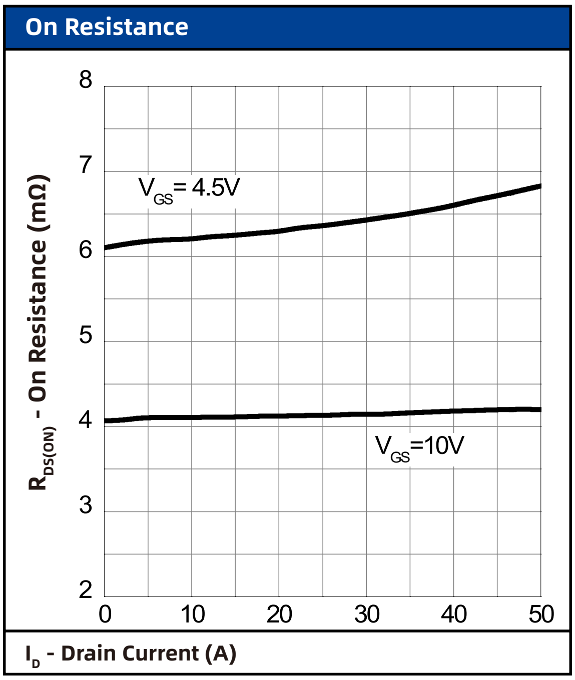


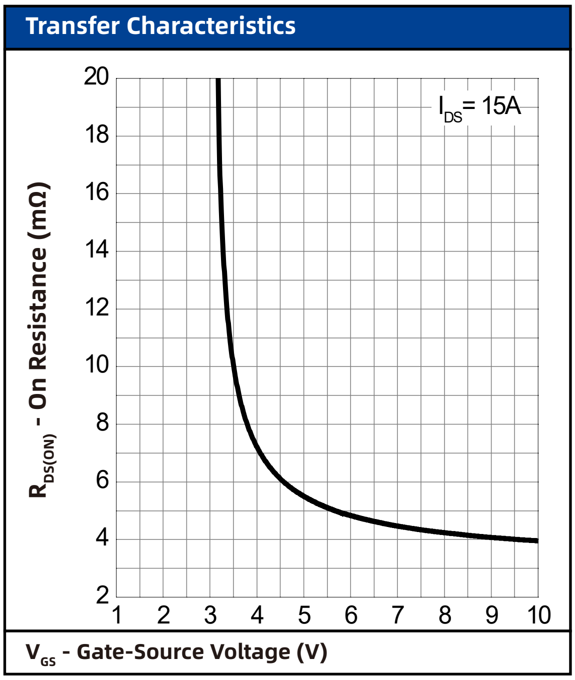
Transient Thermal Impedance

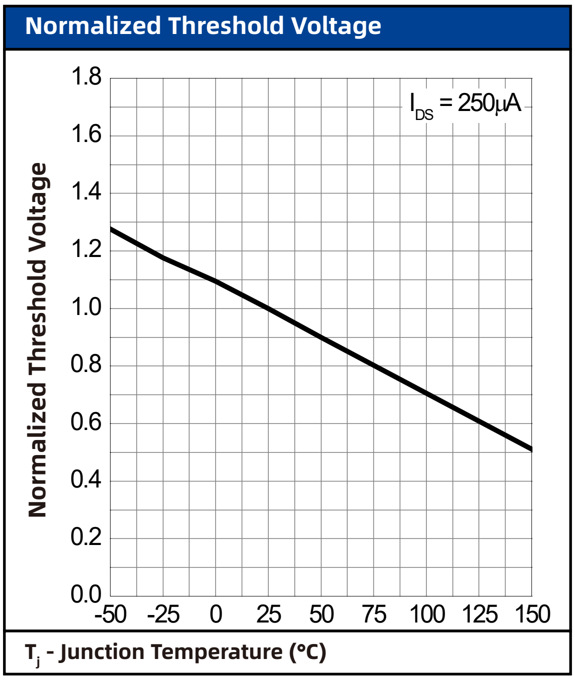


7. Typical Characteristics (cont.)


Output Characteristics

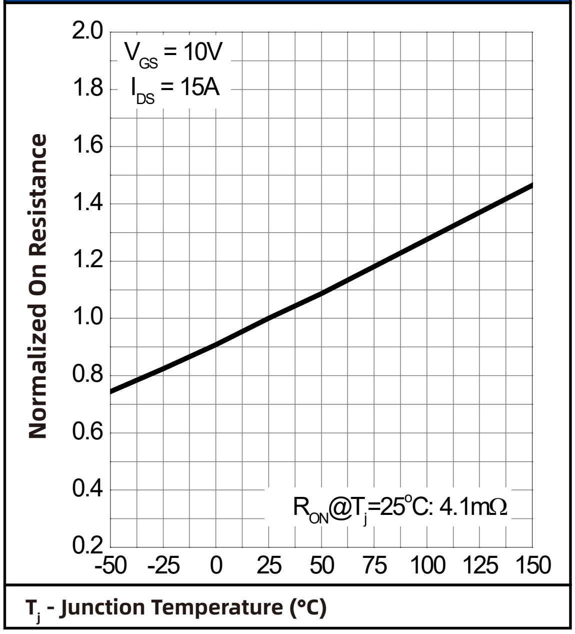

On Resistance


Transfer Characteristics

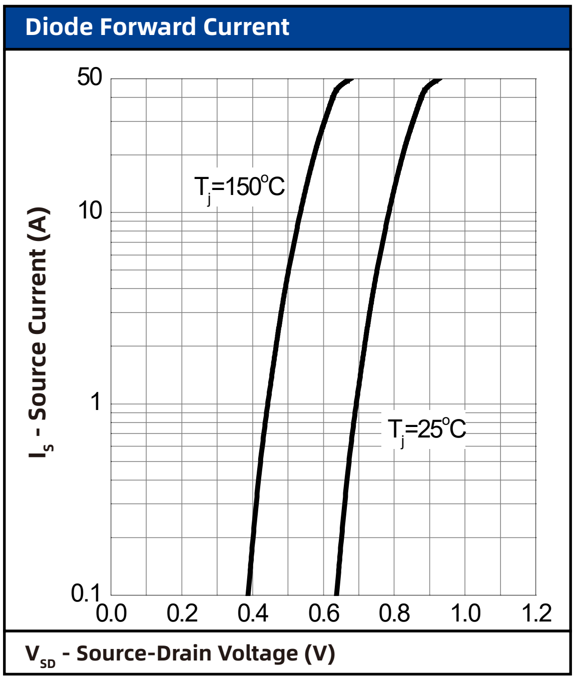

Normalized Threshold Voltage

7. Typical Characteristics (cont.)

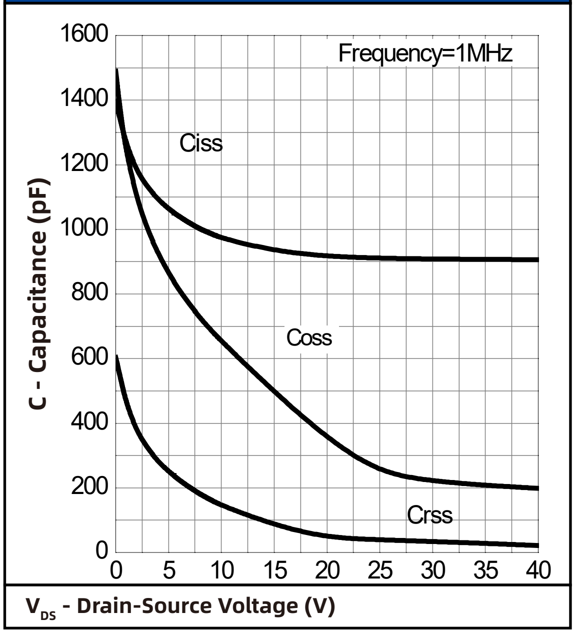
Normalized On Resistance



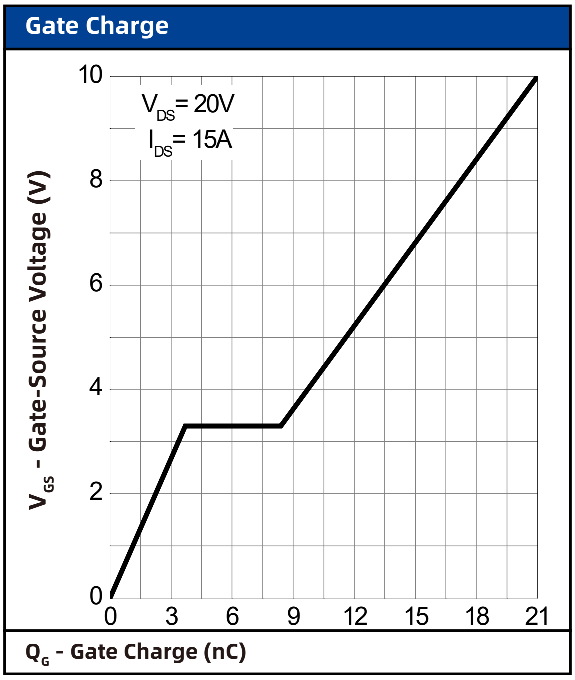
Diode Forward Current



Capacitance

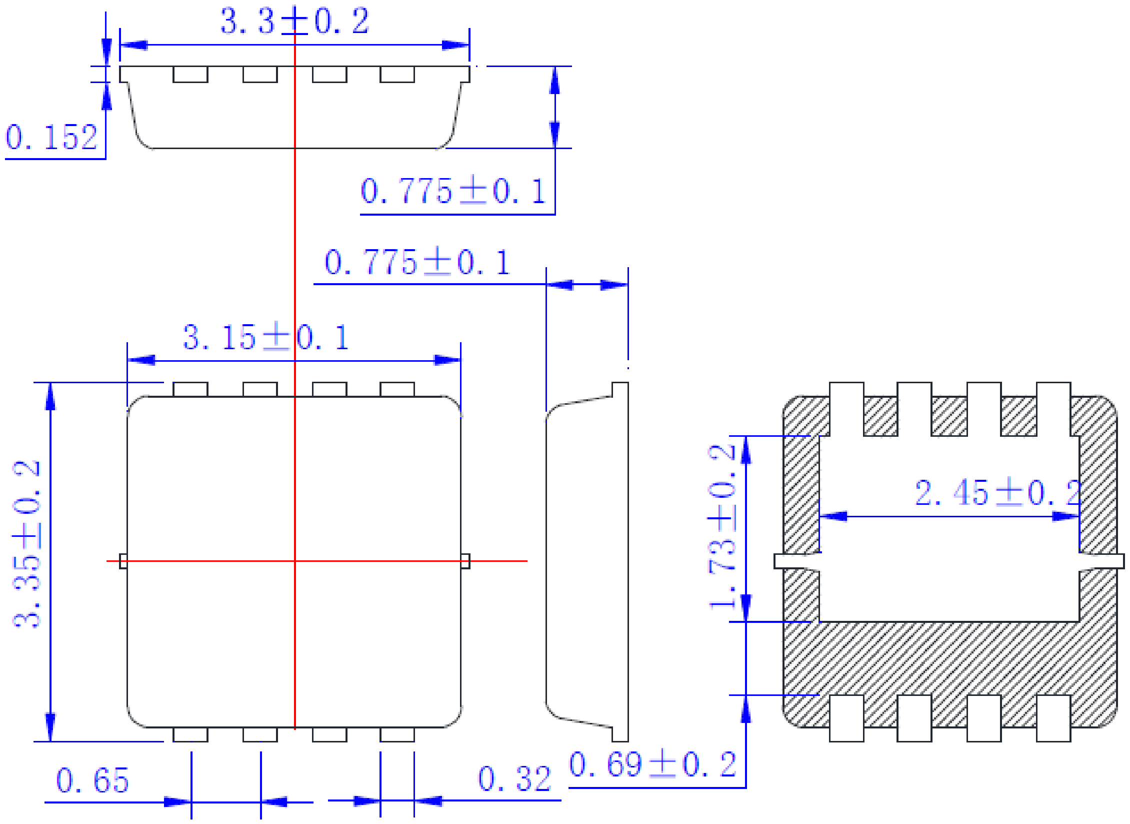


Gate Charge



8. Package Dimensions

PDFN3.3*3.3-8L Package


3. 3±0. 2
0. 152
0. 775±0. 1
0. 775±0. 1
3. 15±0. 1
3. 35±0. 2
1. 73±0. 2
2. 45±0. 2
0. 65
0. 32
0. 69±0. 2