

TN120N40DN

N-Channel Enhancement Mode Power MOSFET

PDFN5x6-8L

Product Summary

- $V_{DS} = 40V, I_D = 120A$
- $R_{DS(on)} < 4.2m\Omega @ V_{GS} = 10V$

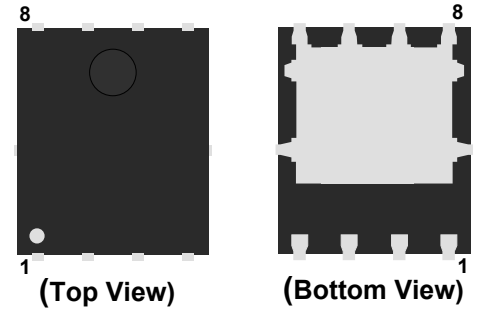
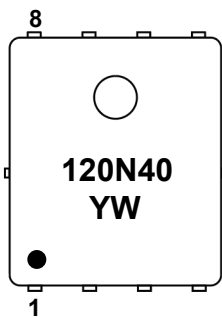
Features

- Advanced Trench Technology
- 100% Avalanche Tested
- RoHS Compliant
- Halogen and Antimony Free
- Moisture Sensitivity Level 3

Application

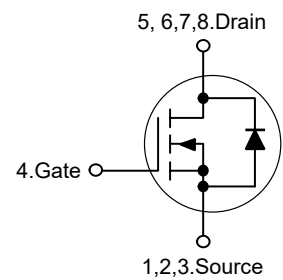
- Consumer electronic power supply
- Synchronous-rectification
- Isolated DC

Marking Code



Pin	Description
1,2,3	Source
4	Gate
5,6,7,8	Drain

Schematic Diagram



Absolute Maximum Ratings

Ratings at 25°C case temperature unless otherwise specified.

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous ^{Note1}	I_D	120	A
Drain Current-Pulsed ^{Note3}	I_{DM}	400	A
Maximum Power Dissipation ^{Note2}	P_D	104	W
Single Pulse Avalanche Energy ^{Note3}	E_{AS}	784	mJ
Junction Temperature	T_J	150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C

Thermal Characteristics

Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1	°C/W
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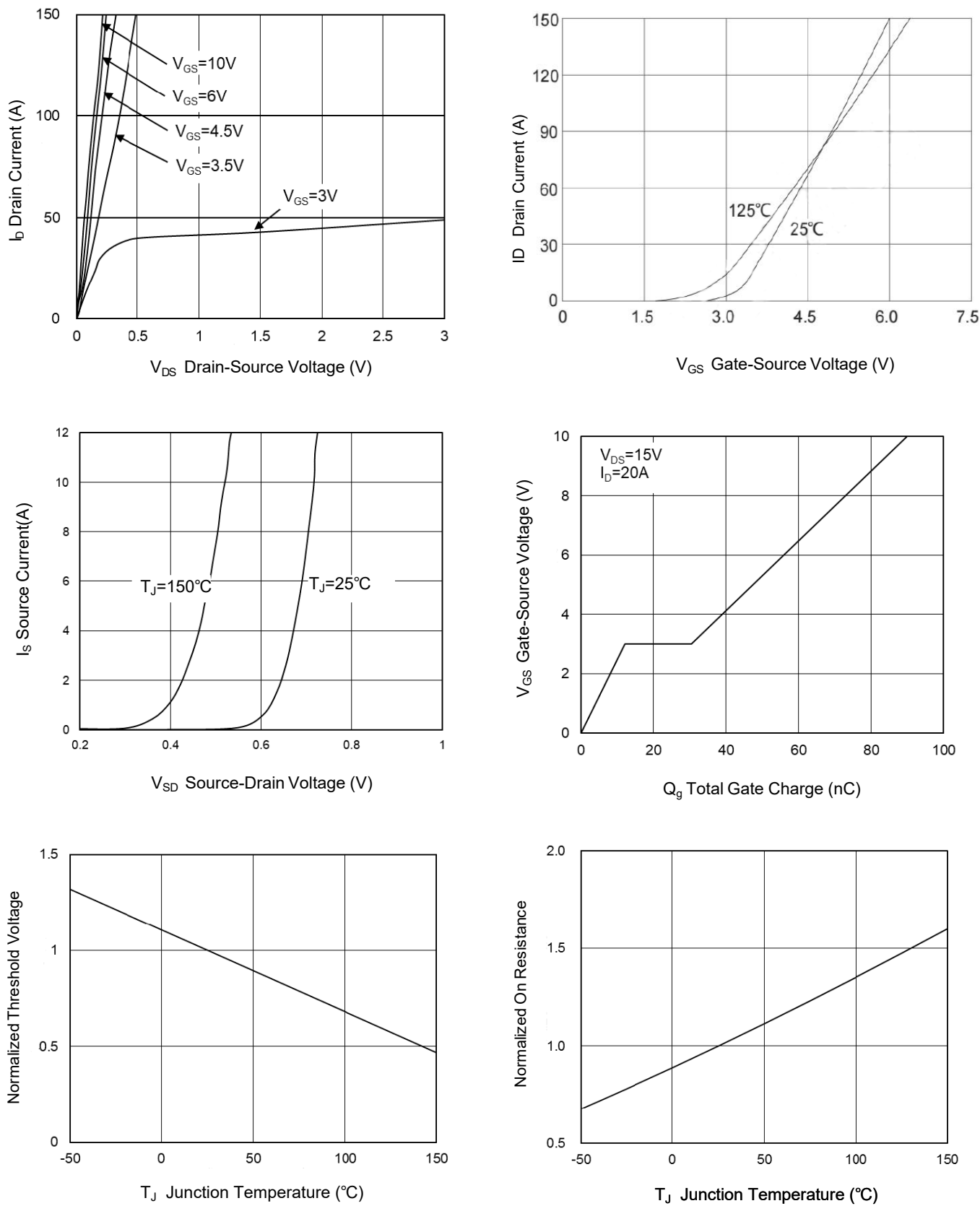
Electrical Characteristics(T_J=25°C unless otherwise specified)

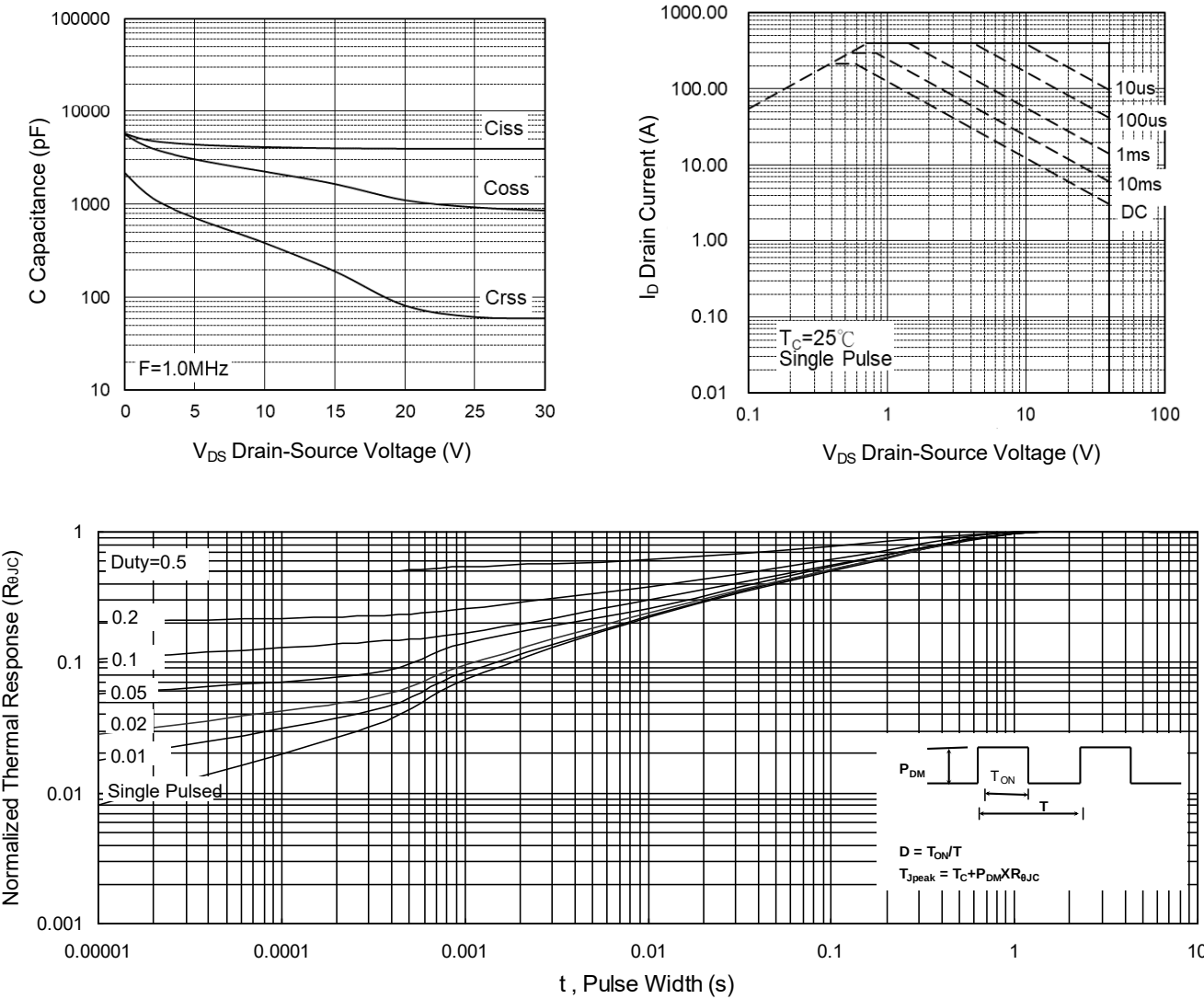
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =0V,I _D =250μA	40	--	--	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =40V,V _{GS} =0V	--	--	1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±20V,V _{DS} =0V	--	--	±100	nA
Gate Threshold Voltage ^{Note3}	V _{GS(th)}	V _{DS} =V _{GS} ,I _D =250μA	1	1.6	2.5	V
Drain-Source On-Resistance ^{Note3}	R _{DS(on)}	V _{GS} =10V,I _D =30A	--	2.6	3.4	mΩ
		V _{GS} =4.5V,I _D =20A	--	3.7	4.8	mΩ
Forward Transconductance ^{Note3}	g _{FS}	V _{DS} =5V,I _D =3A	--	16.2	--	S
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =20V,V _{GS} =0V,f=1MHz	--	5676	--	pF
Output Capacitance	C _{oss}		--	396	--	pF
Reverse Transfer Capacitance	C _{rss}		--	293	--	pF
Total Gate Charge	Q _g	V _{DS} =20V,I _D =30A, V _{GS} =10V	--	59	--	nC
Gate-Source Charge	Q _{gs}		--	11.5	--	nC
Gate-Drain Charge	Q _{gd}		--	15	--	nC
Switching Characteristics						
Turn-on Delay Time	t _{d(on)}	V _{DD} =20V, I _D =30A, V _{GS} =10V, R _{GEN} =3Ω	--	12	--	nS
Turn-on Rise Time	t _r		--	16	--	nS
Turn-off Delay Time	t _{d(off)}		--	39	--	nS
Turn-off Fall Time	t _f		--	15	--	nS
Source-Drain Diode Characteristics						
Diode Forward Voltage ^{Note3}	V _{SD}	V _{GS} =0V,I _S =30A	--	--	1.2	V
Diode Forward Current ^{Note1,5}	I _S		--	--	120	A

Note :

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2.EAS Condition: T_J=25°C, V_{DD}=30V, V_G=10V, R_G=25Ω, L=0.5mH, I_{AS}=56A.
- 3.The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%
- 4.The power dissipation is limited by 150°C junction temperature
- 5.The data is theoretically the same as I_D and I_{DM}, in real applications, should be limited by total power dissipation.

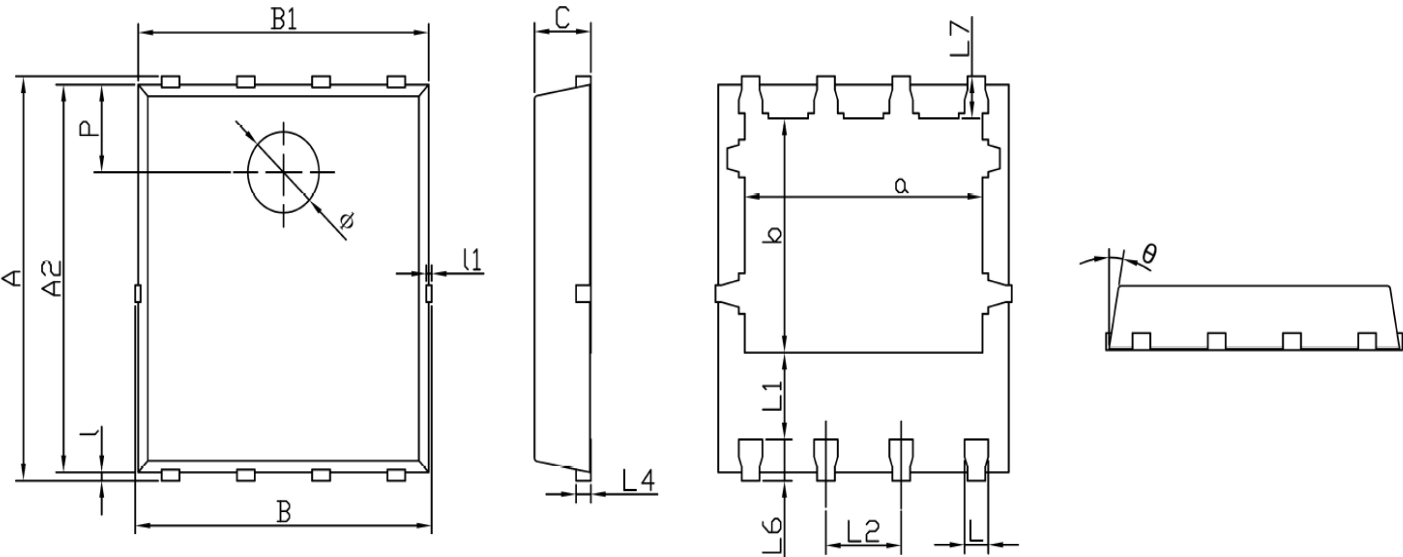
Typical Characteristic Curves





Package Outline

PDFN5x6-8L Dimensions in mm



Symbol	Dimensions		Symbol	Dimensions	
	Min.	Max.		Min.	Max.
A	5.90	6.10	L1	1.10	-
a	3.91	4.11	L1	-	0.10
A2	5.70	5.80	L2	1.17	1.37
B	4.90	5.10	L4	0.21	0.34
b	3.375	3.575	L6	0.51	0.71
B1	4.80	5.00	L7	0.51	0.71
C	0.90	1.00	P	1.15	1.45
L	0.30	0.50	θ	8°	12°
l	0.06	0.20	Φ	1.10	1.30

Contact Information

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For additional information, please contact your local Sales Representative.

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