

TN25C40DN

N and P-Channel Complementary Power MOSFET

PDFN5x6A-8L

Product Summary

N-Channel

- $V_{DS} = 40V, I_D = 24A$
- $R_{DS(on)} < 30m\Omega @ V_{GS} = 10V$
- $R_{DS(on)} < 40m\Omega @ V_{GS} = 4.5V$

P-Channel

- $V_{DS} = -40V, I_D = -21A$
- $R_{DS(on)} < 40m\Omega @ V_{GS} = -10V$
- $R_{DS(on)} < 65m\Omega @ V_{GS} = -4.5V$

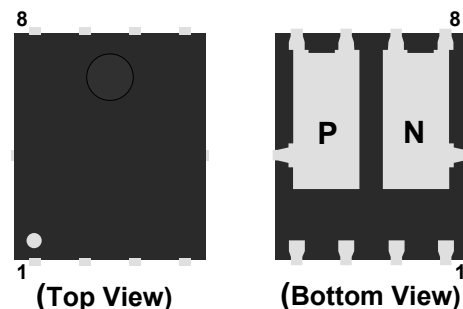
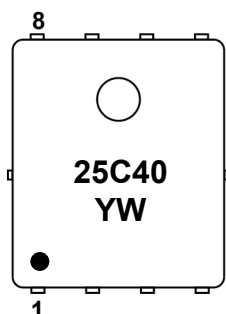
Features

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

Application

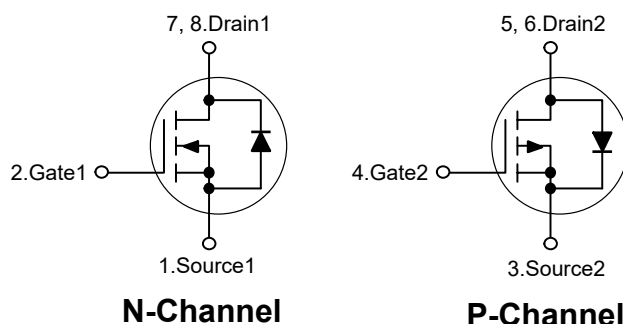
- Load Switch
- PWM Application
- Power Management

Marking Code



Pin	Description	Pin	Description
1	Source1	4	Gate2
2	Gate1	5,6	Drain2
3	Source2	7,8	Drain1

Schematic Diagram



Absolute Maximum Ratings

Ratings at 25°C case temperature unless otherwise specified.

Parameter	Symbol	N-Channel	P-Channel	Unit
Drain-Source Voltage	V_{DS}	40	-40	V
Gate-Source Voltage	V_{GS}	± 20		V
Drain Current-Continuous	I_D	24	-21	A
Drain Current-Pulsed ^{Note1}	I_{DM}	46	-42	A
Maximum Power Dissipation	P_D	35.7		W
Junction Temperature	T_J	150		°C
Storage Temperature Range	T_{STG}	-55 to +150		°C

Thermal Characteristics

Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	3.5	°C/W
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N-Channel**Electrical Characteristics**(T_a=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} =32V, V _{GS} =0V	--	--	1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	--	--	±100	nA
Gate Threshold Voltage ^{Note2}	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1	--	2.5	V
Drain-Source On-Resistance ^{Note2}	R _{DS(on)}	V _{GS} =10V, I _D =12A	--	--	30	mΩ
		V _{GS} =4.5V, I _D =10A	--	--	40	mΩ
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =15V, V _{GS} =0V, f=1MHz	--	593	--	pF
Output Capacitance	C _{oss}		--	76	--	pF
Reverse Transfer Capacitance	C _{rss}		--	56	--	pF
Total Gate Charge	Q _g	V _{DS} =20V, I _D =12A, V _{GS} =4.5V	--	5.5	--	nC
Gate-Source Charge	Q _{gs}		--	1.25	--	nC
Gate-Drain Charge	Q _{gd}		--	2.5	--	nC
Switching Characteristics						
Turn-on Delay Time	t _{d(on)}	V _{DD} =20V, I _D =1A, V _{GS} =10V, R _{GEN} =3.3Ω	--	8.9	--	nS
Turn-on Rise Time	t _r		--	2.2	--	nS
Turn-off Delay Time	t _{d(off)}		--	41	--	nS
Turn-off Fall Time	t _f		--	2.7	--	nS
Source-Drain Diode Characteristics						
Diode Forward Voltage ^{Note2}	V _{SD}	V _{GS} =0V, I _S =1A	--	--	1.2	V
Diode Forward Current	I _S		--	--	24	A

P-Channel**Electrical Characteristics**(T_a=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} =-32V,V _{GS} =0V	--	--	1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±20V,V _{DS} =0V	--	--	±100	nA
Gate Threshold Voltage ^{Note2}	-V _{GS(th)}	V _{DS} =V _{GS} ,I _D =-250μA	1	--	2.5	V
Drain-Source On-Resistance ^{Note2}	R _{DS(on)}	V _{GS} =-10V,I _D =-12A	--	--	40	mΩ
		V _{GS} =-4.5V,I _D =-10A	--	--	65	mΩ
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =-15V,V _{GS} =0V,f=1MHz	--	1004	--	pF
Output Capacitance	C _{oss}		--	108	--	pF
Reverse Transfer Capacitance	C _{rss}		--	80	--	pF
Total Gate Charge	Q _g	V _{DS} =-20V,I _D =-12A, V _{GS} =-4.5V	--	9	--	nC
Gate-Source Charge	Q _{gs}		--	2.54	--	nC
Gate-Drain Charge	Q _{gd}		--	3.1	--	nC
Switching Characteristics						
Turn-on Delay Time	t _{d(on)}	V _{DD} =-15V, I _D =-1A, V _{GS} =-10V, R _{GEN} =13.3Ω	--	19.2	--	nS
Turn-on Rise Time	t _r		--	12.8	--	nS
Turn-off Delay Time	t _{d(off)}		--	48.6	--	nS
Turn-off Fall Time	t _f		--	4.6	--	nS
Source-Drain Diode Characteristics						
Diode Forward Voltage ^{Note2}	-V _{SD}	V _{GS} =0V,I _S =-1A	--	--	1.2	V
Diode Forward Current	-I _S		--	--	21	A

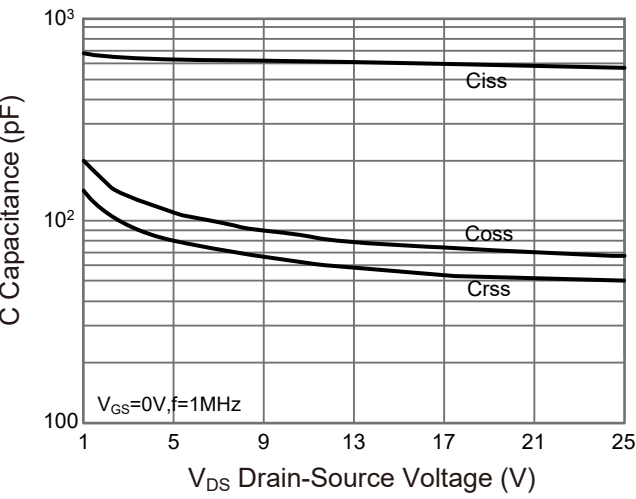
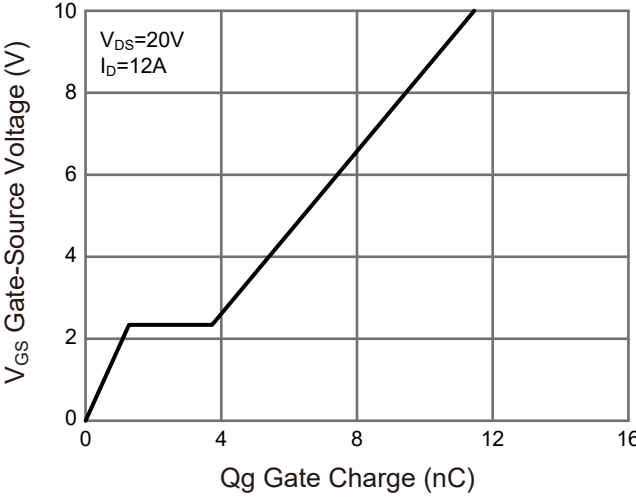
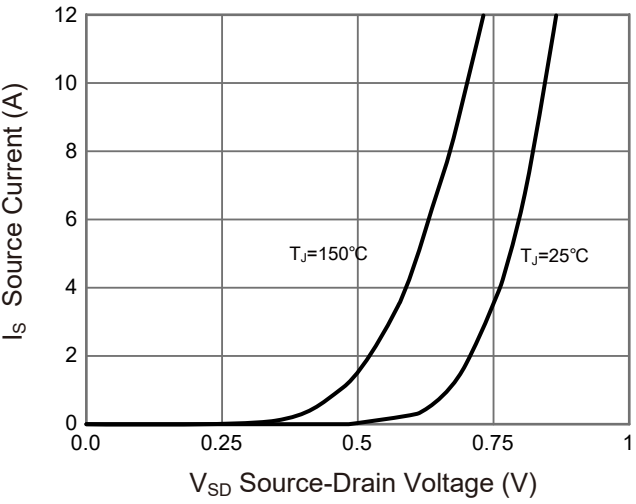
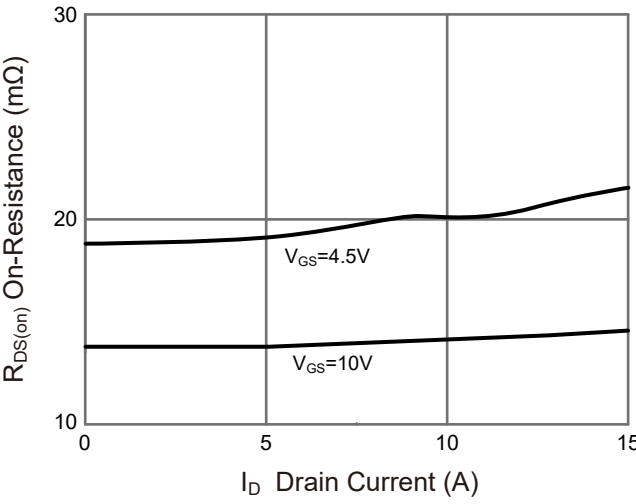
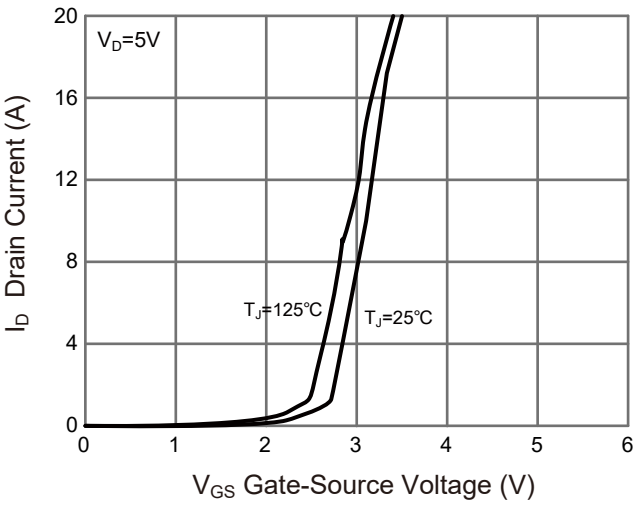
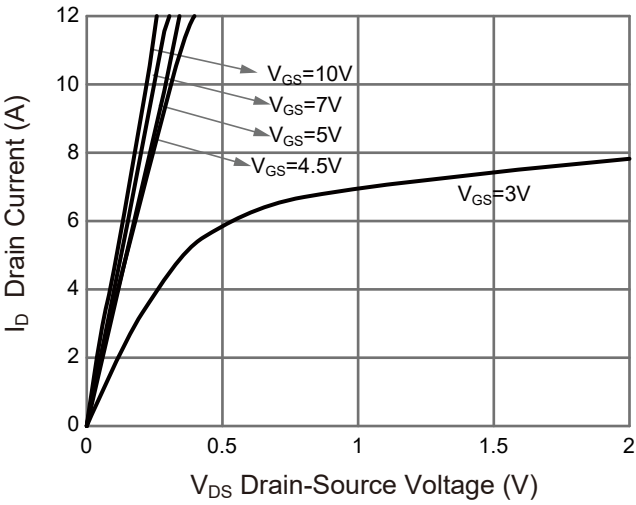
Note :

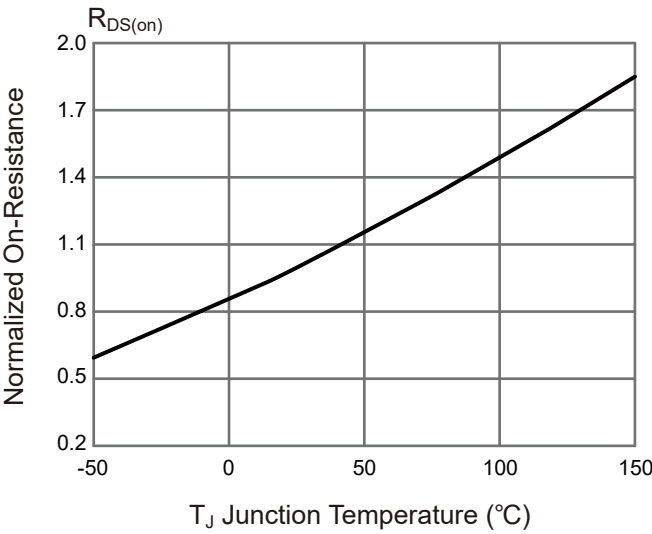
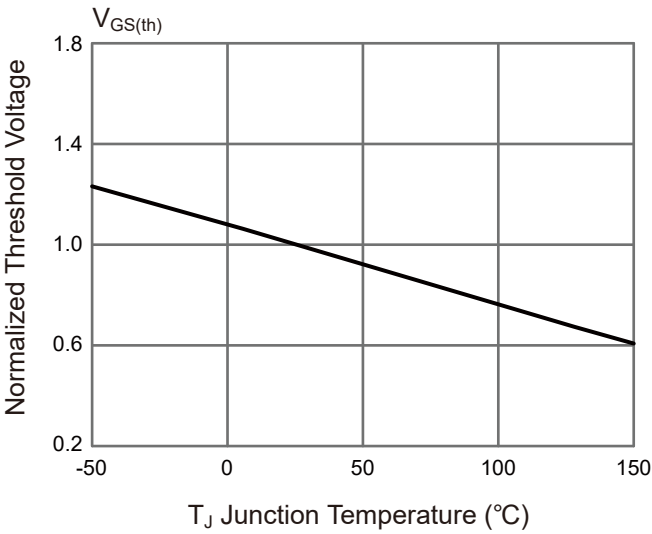
1. Repetitive Rating: Pulse width limited by maximum junction temperature.

2. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.

N-Channel

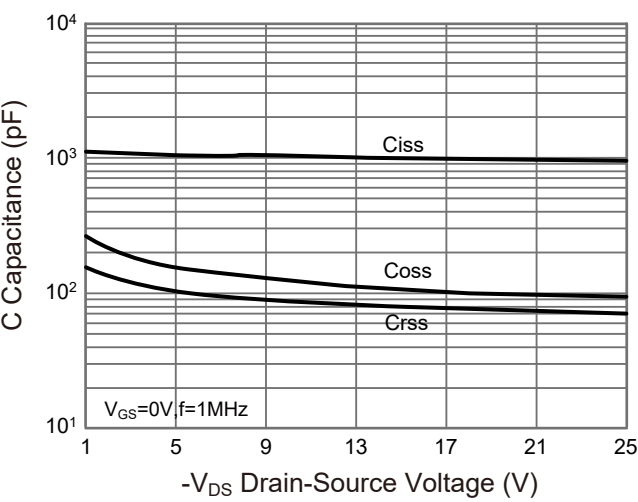
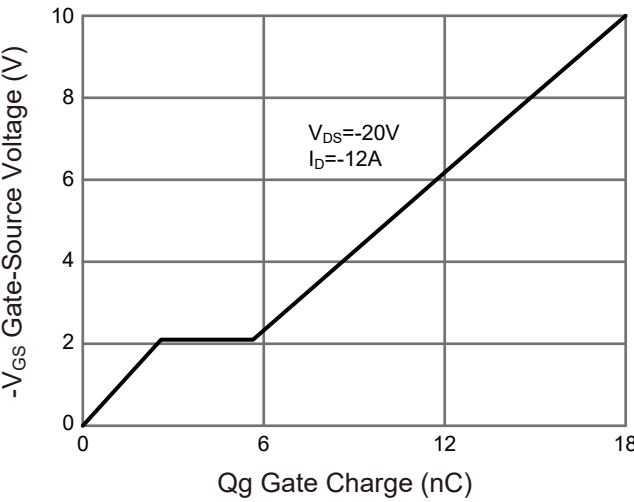
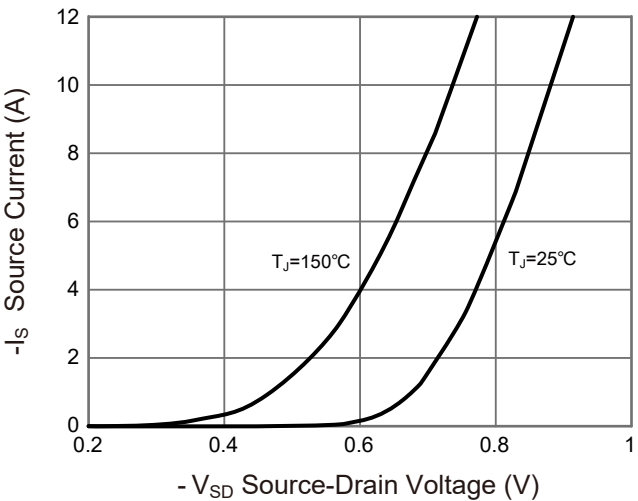
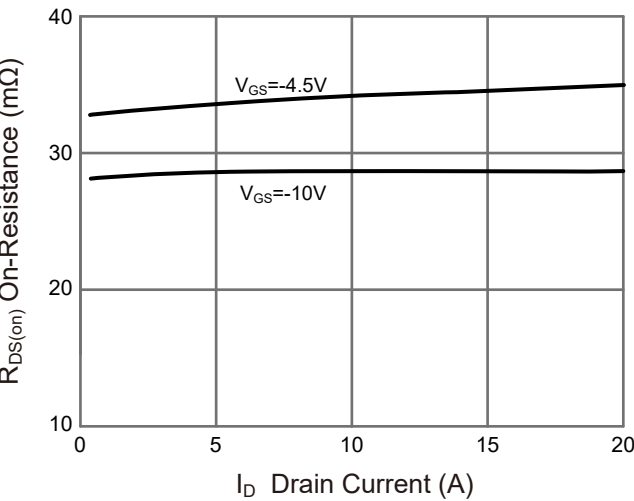
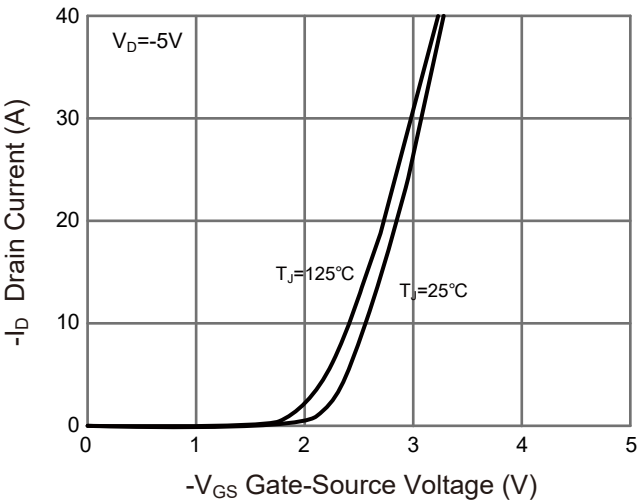
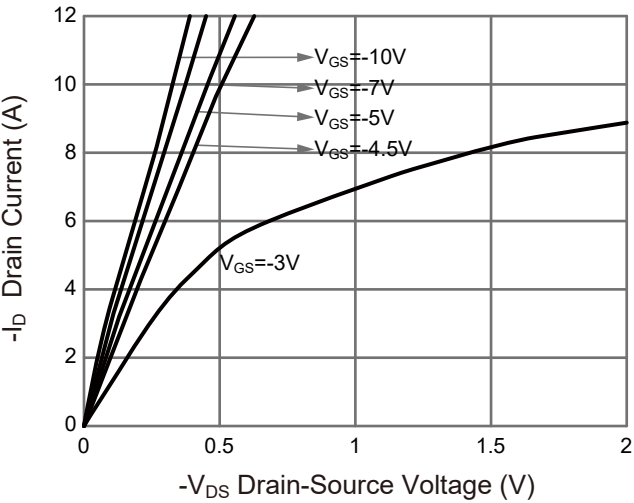
Typical Characteristics Curves

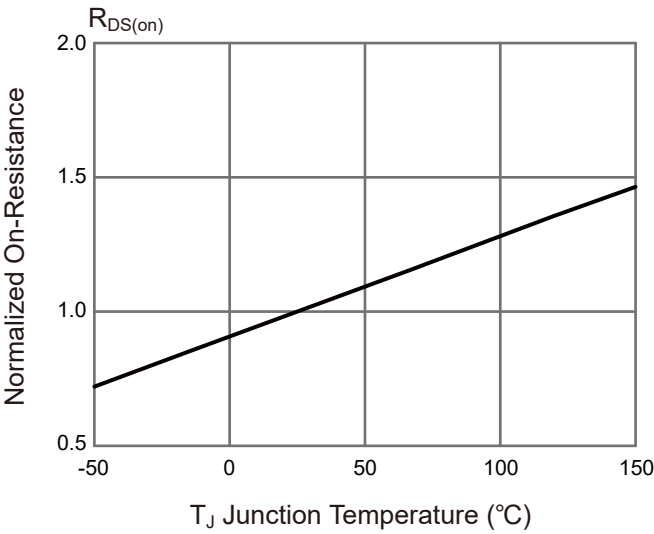
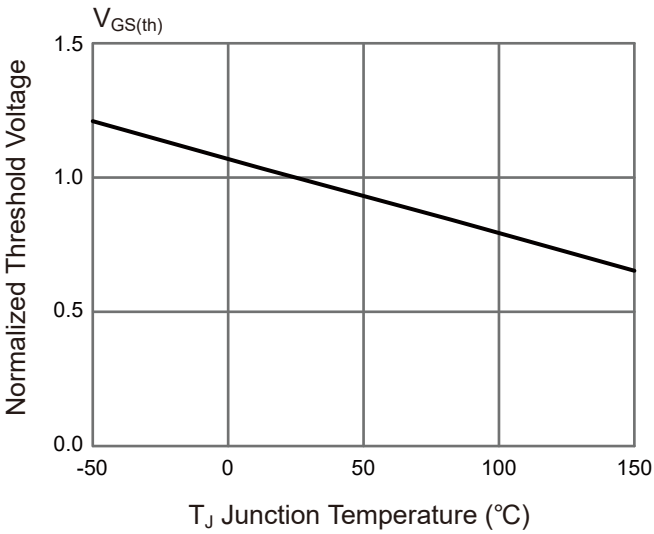




P-Channel

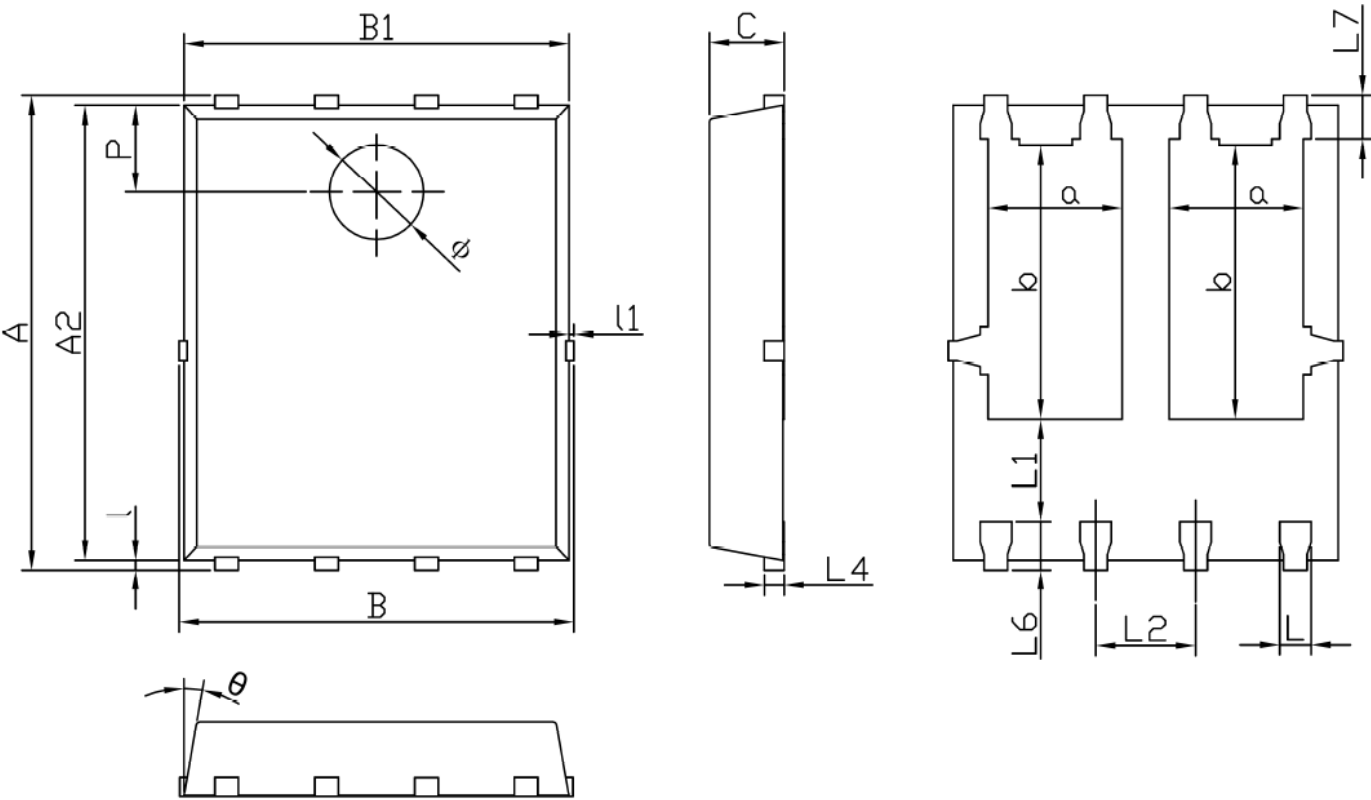
Typical Characteristics Curves





Package Outline

PDFN5x6A-8L
Dimensions in mm



Symbol	Dimensions		Symbol	Dimensions	
	Min.	Max.		Min.	Max.
A	5.90	6.10	L1	1.10	-
a	1.605	1.805	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	0.45	0.65
C	0.90	1.00	P	1.00	1.20
L	0.35	0.45	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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