



## -60/-25A P- Channel Enhancement Mode Power MOSSFET

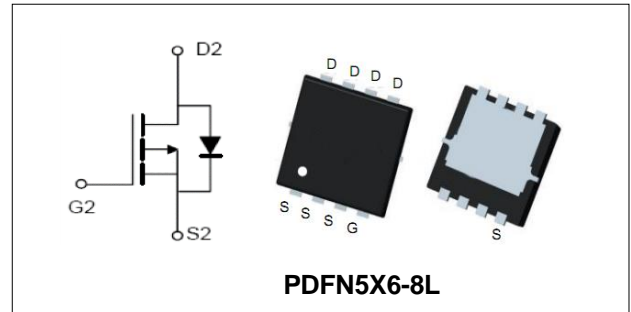
### Features

- Improved dv/dt Capability, High Ruggedness
- Maximum Junction Temperature Range (150°C)

BVDSS	-60	V
ID	-25	A
RDSON@VGS=-10V	35	mΩ
RDSON@VGS=-4.5V	46	mΩ

### Applications

- DC Fan
- Brushless motor
- Optimized for Power Management Applications for Portable Products, such as H-bridge, Inverters Car Charger and Others



### Order Information

Product	Package	Marking	Reel Size	Reel	Carton
PGN06P420	PDFN5X6-8L	PGN06P420	13inch	5000PCS	50000PCS

### Absolute Maximum Ratings

Symbol	Parameter	Unit
<b>Common Ratings (TC=25°C Unless Otherwise Noted)</b>		
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	-60 V
$V_{GS}$	Gate-Source Voltage	±20 V
$T_J$	Maximum Junction Temperature	150 °C
$T_{STG}$	Storage Temperature Range	-50 to 150 °C
$I_S$	Diode Continuous Forward Current	TC =25°C -15 A
<b>Mounted on Large Heat Sink</b>		
$E_{AS}$	Single Pulse Avalanche Energy (Note1)	32 mJ
$I_{DM}$	Pulse Drain Current Tested (Silicon Limit) (Note2)	TC =25°C -60 A
$I_D$	Continuous Drain current	TC =25°C -15 A
$P_D$	Maximum Power Dissipation	TC =25°C 35 W
$R_{θJC}$	Thermal Resistance Junction-to-Case (Note3)	3.57 °C/W

**-60/-25A P- Channel Enhancement Mode Power MOSFET****P-Channel Electrical Characteristics**

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
<b>Static Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated)</b>						
V <sub>(BR)DSS</sub>	Drain- Source Breakdown Voltage	VGS=0V ID=-250μA	-60	--	--	V
I <sub>DSS</sub>	Zero Gate Voltage Drain current	VDS=-60V,VGS=0V	--	--	1	μA
I <sub>GSS</sub>	Gate-Body Leakage Current	VGS=±20V,VDS=0V	--	--	±100	nA
V <sub>GS(TH)</sub>	Gate Threshold Voltage	VDS=VGS,ID=-250μA	-1	-2	-2.5	V
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance (Note4)	VGS=-10V, ID=-12A	--	35	42	mΩ
		VGS=-4.5V, ID=-8A	--	46	53	mΩ
<b>Dynamic Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated) (Note5)</b>						
C <sub>iss</sub>	Input Capacitance	VDS= -30V, VGS=0V, F=1MHz	--	946	--	pF
C <sub>oss</sub>	Output Capacitance		--	188	--	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		--	8.8	--	pF
Q <sub>g</sub>	Total Gate Charge	VDS= -30V, ID= -7A, VGS= -10V	--	12.8	--	nC
Q <sub>gs</sub>	Gate-Source Charge		--	3.2	--	nC
Q <sub>gd</sub>	Gate-Drain Charge		--	1.5	--	nC
<b>Switching Characteristics (Note5)</b>						
t <sub>d(on)</sub>	Turn-on Delay Time	VDD=- 30V, ID=-4A, VGS=-10V, RG=3Ω	--	5.3	--	nS
t <sub>r</sub>	Turn-on Rise Time		--	1.6	--	nS
t <sub>d(off)</sub>	Turn-off Delay Time		--	20	--	nS
t <sub>f</sub>	Turn-off Fall Time		--	3.9	--	nS
<b>Source- Drain Diode Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated)</b>						
V <sub>SD</sub>	Forward on voltage (Note3)	IS=-7.5A,VGS=0V	--	--	-1.2	V

Note:

- Limited by T<sub>Jmax</sub>, starting T<sub>J</sub> = 25° C, RG = 4.5Ω, VD = -20V, VGS = -10V. Part not recommended for use above this value.
- Repetitive Rating: Pulse width limited by maximum junction temperature.
- Surface Mounted on FR4 Board, t ≤ 10 sec.
- Pulse Test: pulse width ≤ 300 us, duty cycle ≤ 2%.
- Guaranteed by design, not subject to production testing.



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Typical Characteristics

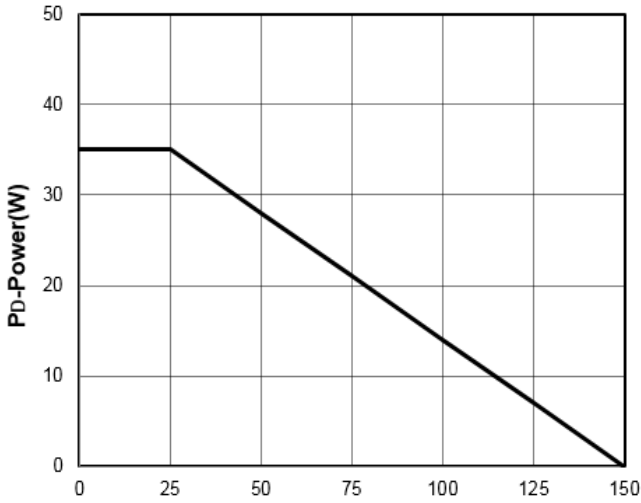


Figure11: T<sub>J</sub>-Junction Temperature (°C)

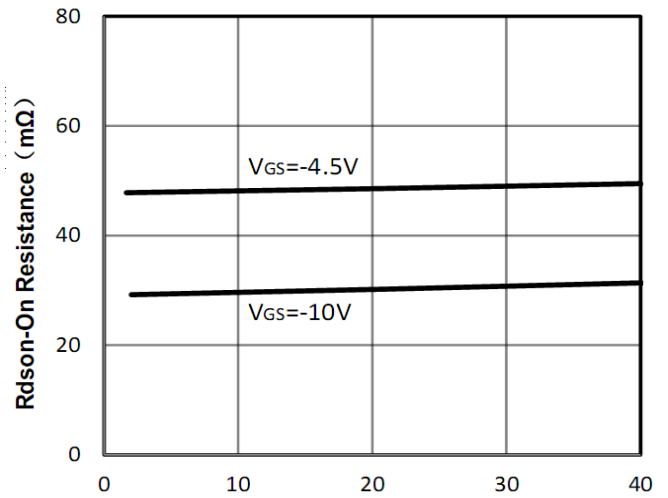


Figure12: -I<sub>D</sub>-Drain Current (A)

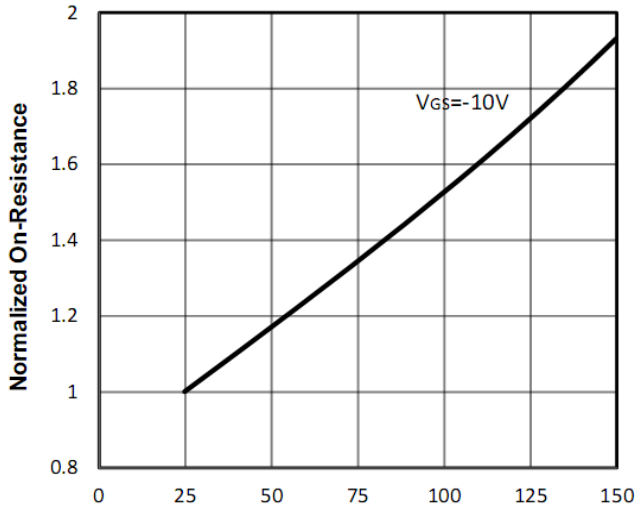


Figure13: -T<sub>J</sub> Junction Temperature (°C)

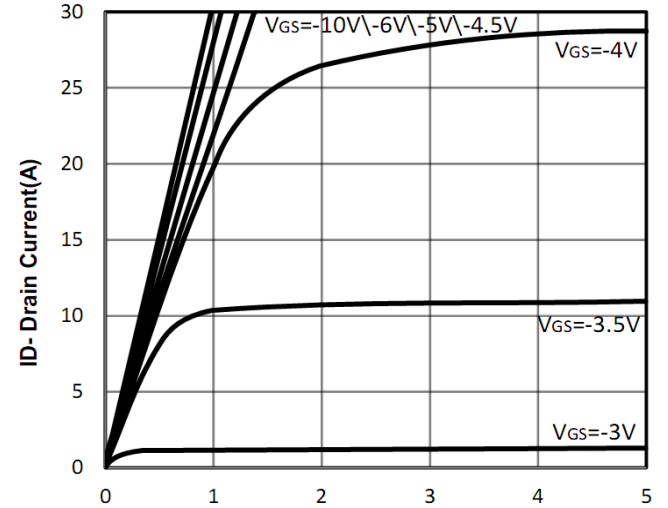


Figure14: -V<sub>DS</sub>-Drain-Source Voltage (V)

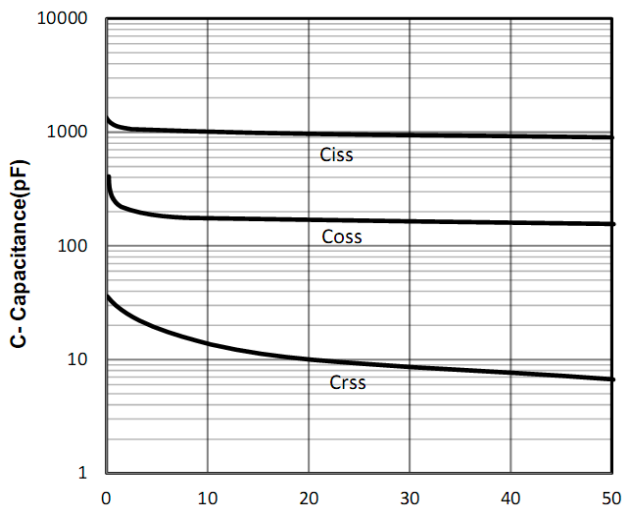


Figure15: -V<sub>DS</sub>-Drain-Source Voltage (V)

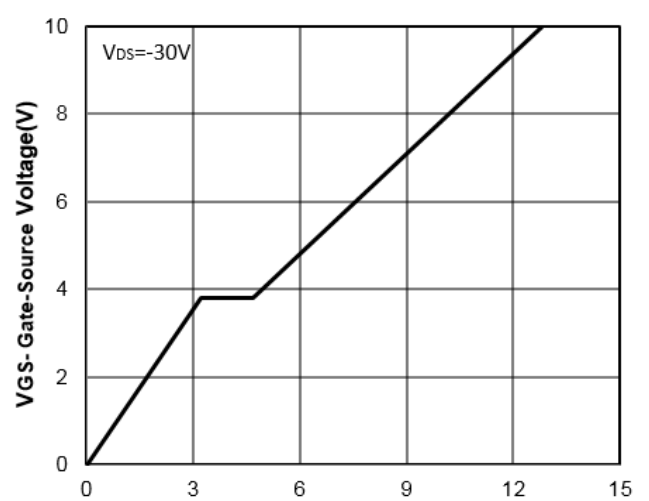


Figure16: Q<sub>g</sub>-Gate Charge (nC)



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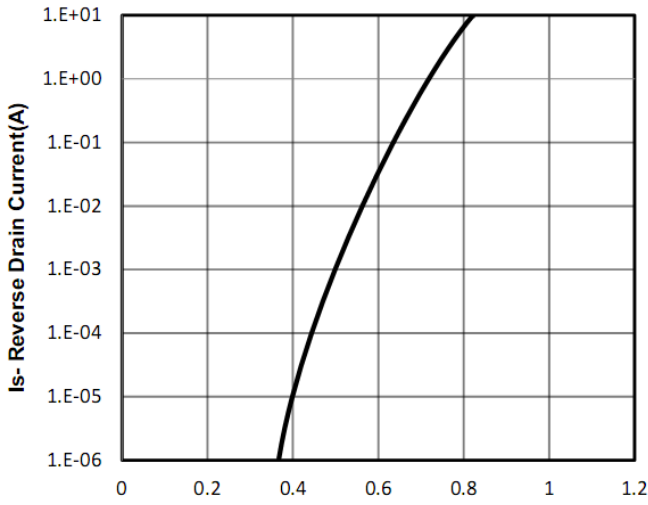


Figure17: -Vsd -Source-Drain Voltage (V)

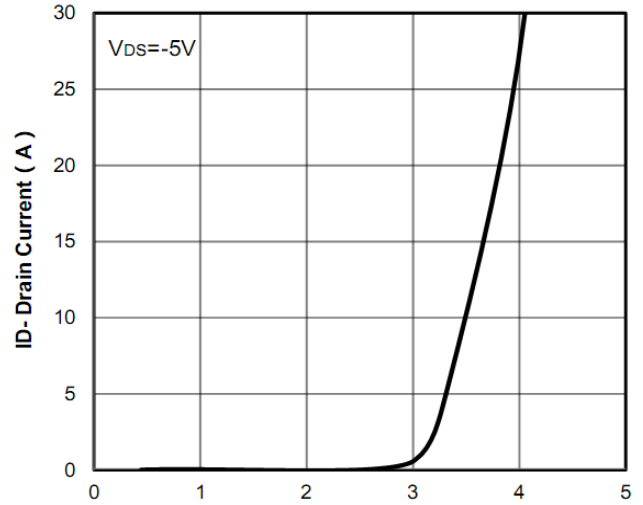


Figure18: -Vgs -Gate-Source Voltage (V)

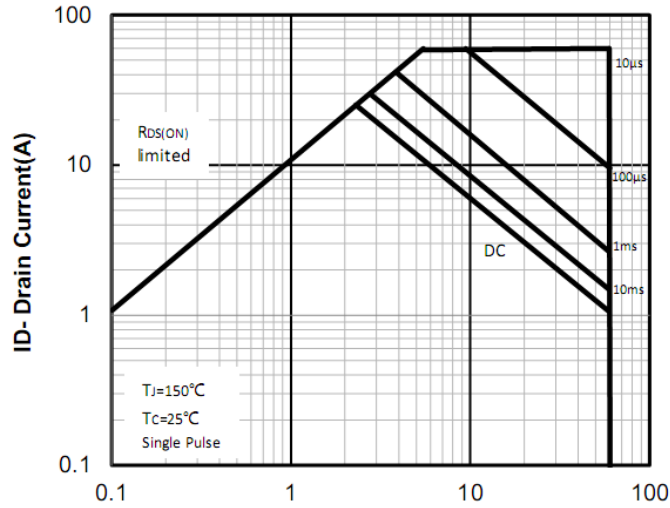


Figure19: -VDS -Drain -Source Voltage (V)

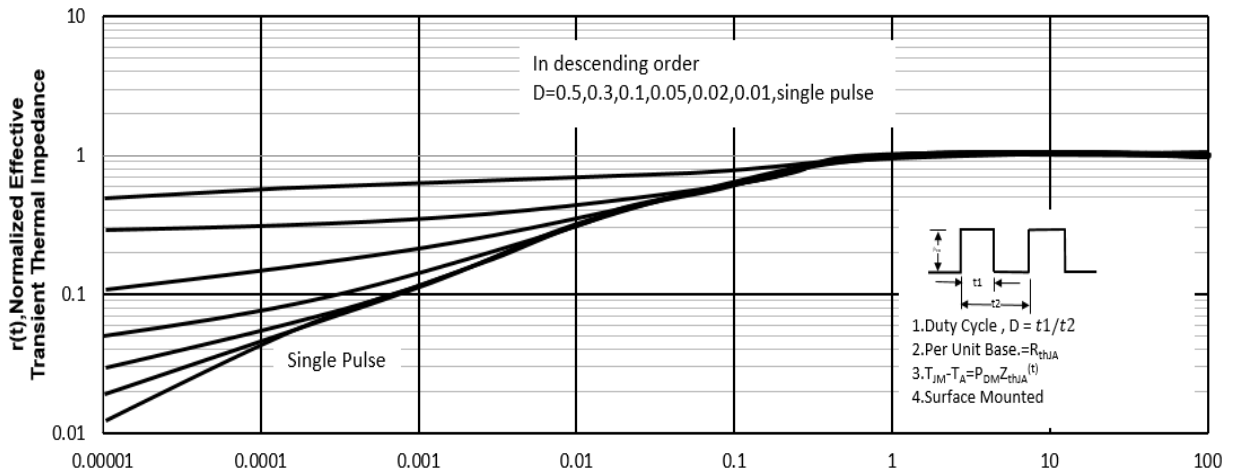


Figure20: Square Wave Pulse Duration (sec)

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### Test Circuit and Waveform (P-Channel):

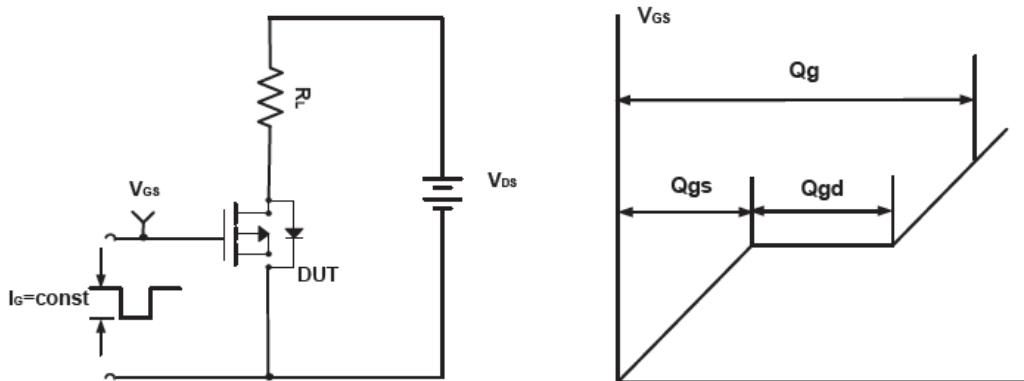


Figure D Gate Charge Test Circuit & Waveforms

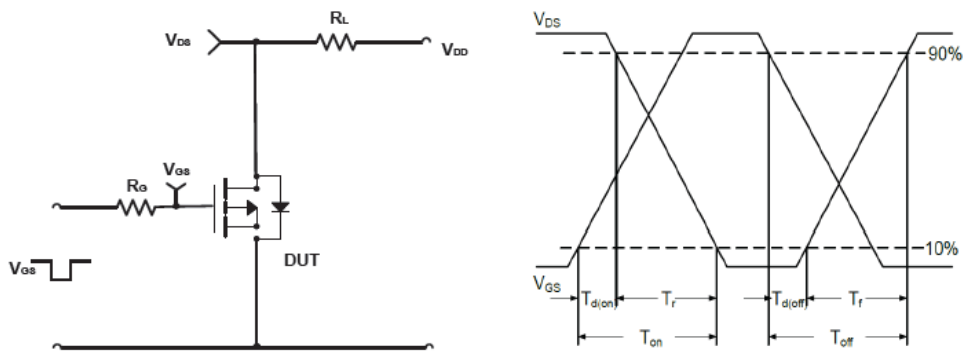


Figure E Switching Test Circuit & Waveforms

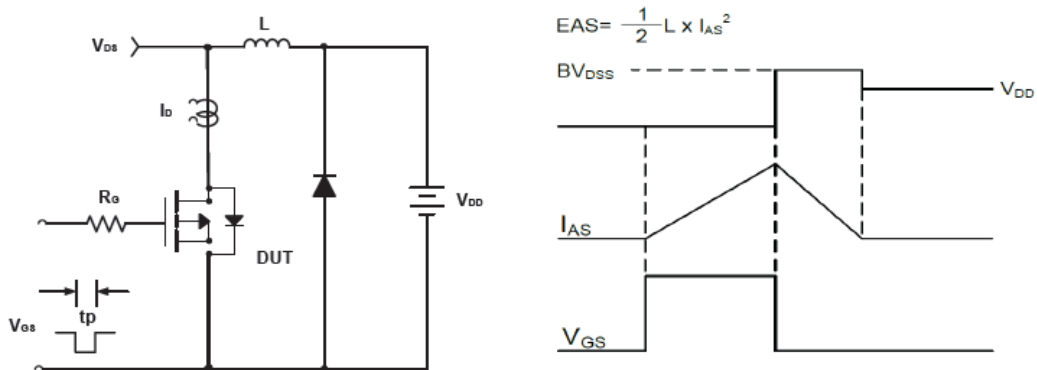
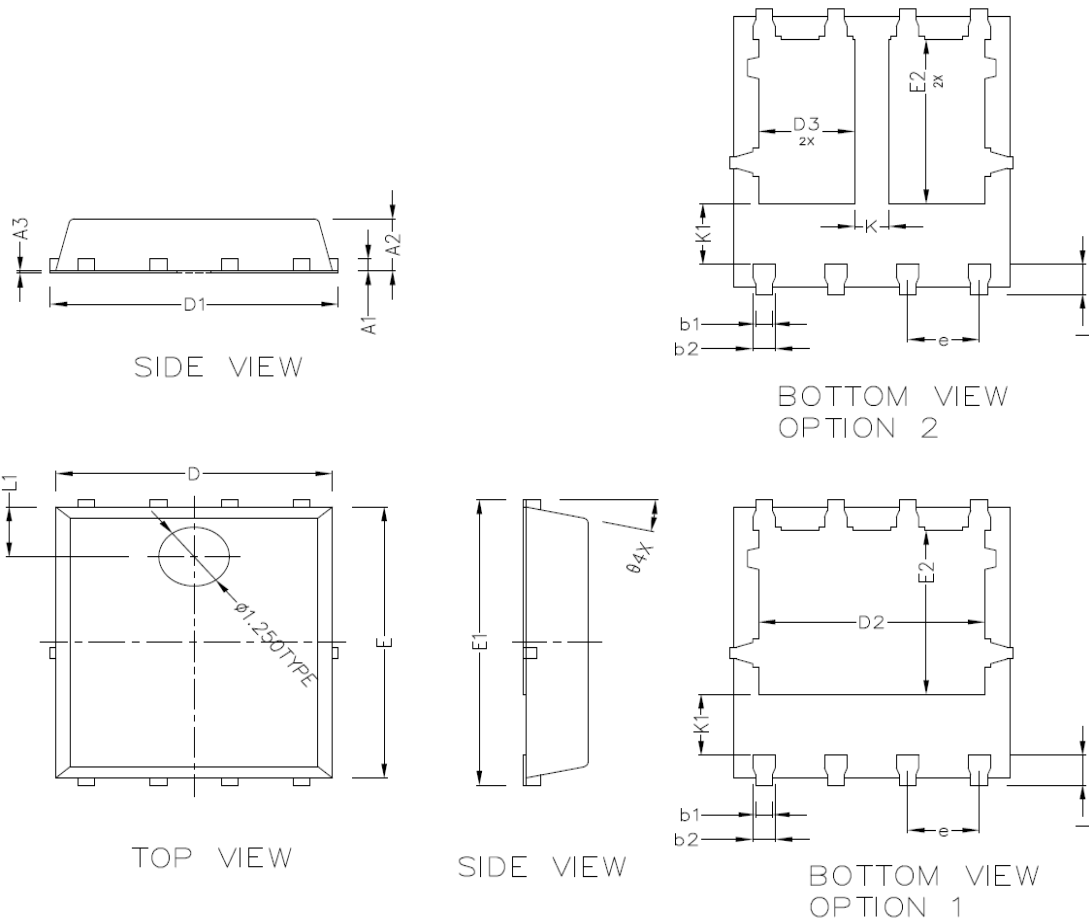


Figure F Unclamped Inductive Switching Circuit & Waveforms



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PDFN5X6-8L Package Outline Dimensions (Units: mm)



COMMON DIMENSIONS (UNITS OF MEASURE IS mm)			
	MIN	NORMAL	MAX
A1	0.254 BSC		
A2	1.000	1.100	1.200
A3	0.006	-	0.020
b1	0.250	0.300	0.360
b2	0.350	0.400	0.460
D	4.800	4.900	5.000
D1	5.000	5.100	5.200
D2	3.910	4.010	4.110
D3	1.605	1.705	1.805
E	5.650	5.750	5.850
E1	5.950	6.050	6.150
E2	3.375	3.475	3.575
e	1.270 TYPE		
L	0.630	0.630	0.730
L1	1.00REF		
θ	13° TYPE		
K	0.600 REF		
K1	1.235 REF		