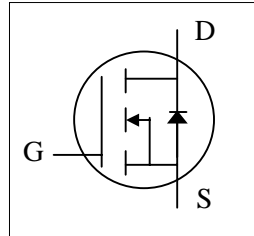


- ▼ 100% R<sub>g</sub> & UIS Test
- ▼ Simple Drive Requirement
- ▼ Low On-resistance
- ▼ RoHS Compliant & Halogen-Free

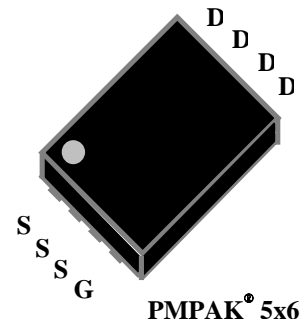


BV <sub>DSS</sub>	100V
R <sub>DS(ON)</sub>	11mΩ
I <sub>D</sub>	49A

### Description

XP10NA011 series are innovated design and silicon process technology to achieve the lowest possible on-resistance and fast switching performance. It provides the designer with an extreme efficient device for use in a wide range of power applications.

The PMPAK<sup>®</sup> 5x6 package is special for DC-DC converters application and the foot print is compatible with SO-8 with backside heat sink and lower profile.



### Absolute Maximum Ratings @T<sub>j</sub>=25°C (unless otherwise specified)

Symbol	Parameter	Rating	Units
V <sub>DS</sub>	Drain-Source Voltage	100	V
V <sub>GS</sub>	Gate-Source Voltage	±20	V
I <sub>D</sub> @T <sub>C</sub> =25°C	Drain Current, V <sub>GS</sub> @ 10V	49	A
I <sub>D</sub> @T <sub>C</sub> =100°C	Drain Current, V <sub>GS</sub> @ 10V	31	A
I <sub>D</sub> @T <sub>A</sub> =25°C	Drain Current, V <sub>GS</sub> @ 10V <sup>3</sup>	15.5	A
I <sub>D</sub> @T <sub>A</sub> =70°C	Drain Current, V <sub>GS</sub> @ 10V <sup>3</sup>	12.4	A
I <sub>DM</sub>	Pulsed Drain Current <sup>1</sup>	160	A
P <sub>D</sub> @T <sub>C</sub> =25°C	Total Power Dissipation	50	W
P <sub>D</sub> @T <sub>A</sub> =25°C	Total Power Dissipation <sup>3</sup>	5	W
E <sub>AS</sub>	Single Pulse Avalanche Energy <sup>4</sup>	28.8	mJ
T <sub>STG</sub>	Storage Temperature Range	-55 to 150	°C
T <sub>J</sub>	Operating Junction Temperature Range	-55 to 150	°C

### Thermal Data

Symbol	Parameter	Value	Unit
R <sub>thj-c</sub>	Maximum Thermal Resistance, Junction-case	2.5	°C/W
R <sub>thj-a</sub>	Maximum Thermal Resistance, Junction-ambient <sup>3</sup>	25	°C/W

**Electrical Characteristics @T<sub>j</sub>=25°C(unless otherwise specified)**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	100	-	-	V
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance <sup>2</sup>	V <sub>GS</sub> =10V, I <sub>D</sub> =20A	-	-	11	mΩ
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	2	-	4	V
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =5V, I <sub>D</sub> =20A	-	38	-	S
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =80V, V <sub>GS</sub> =0V	-	-	25	uA
I <sub>GSS</sub>	Gate-Source Leakage	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	-	-	±0.1	uA
Q <sub>g</sub>	Total Gate Charge <sup>5</sup>	I <sub>D</sub> =20A	-	32	51.2	nC
Q <sub>gs</sub>	Gate-Source Charge <sup>5</sup>	V <sub>DS</sub> =50V	-	7.5	-	nC
Q <sub>gd</sub>	Gate-Drain ("Miller") Charge <sup>5</sup>	V <sub>GS</sub> =10V	-	12	-	nC
t <sub>d(on)</sub>	Turn-on Delay Time <sup>5</sup>	V <sub>DS</sub> =50V	-	12	-	ns
t <sub>r</sub>	Rise Time <sup>5</sup>	I <sub>D</sub> =20A	-	52	-	ns
t <sub>d(off)</sub>	Turn-off Delay Time <sup>5</sup>	R <sub>G</sub> =6Ω	-	28	-	ns
t <sub>f</sub>	Fall Time <sup>5</sup>	V <sub>GS</sub> =10V	-	67	-	ns
C <sub>iss</sub>	Input Capacitance <sup>5</sup>	V <sub>GS</sub> =0V	-	1430	2288	pF
C <sub>oss</sub>	Output Capacitance <sup>5</sup>	V <sub>DS</sub> =80V	-	230	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance <sup>5</sup>	f=1.0MHz	-	15	-	pF
R <sub>g</sub>	Gate Resistance	f=1.0MHz	-	1.3	2.6	Ω

**Source-Drain Diode**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V <sub>SD</sub>	Forward On Voltage <sup>2</sup>	I <sub>S</sub> =20A, V <sub>GS</sub> =0V	-	-	1.3	V
t <sub>rr</sub>	Reverse Recovery Time <sup>5</sup>	I <sub>S</sub> =20A, V <sub>GS</sub> =0V,	-	52	-	ns
Q <sub>rr</sub>	Reverse Recovery Charge <sup>5</sup>	dI/dt=100A/μs	-	77	-	nC

**Notes:**

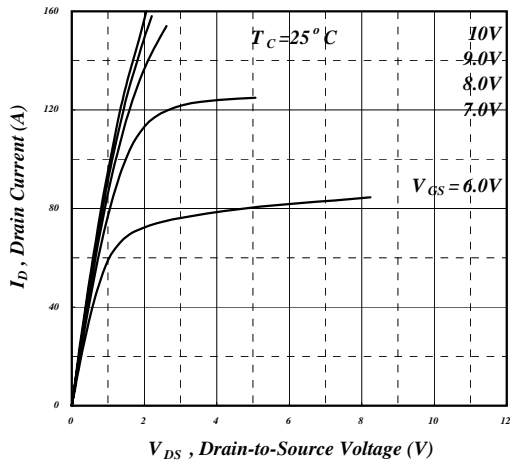
- 1.Pulse width limited by Max. junction temperature.
- 2.Pulse test
- 3.Surface mounted on 1 in<sup>2</sup> copper pad of FR4 board, t ≤10sec; 60°C/W at steady state.
- 4.Starting T<sub>j</sub>=25°C , V<sub>DD</sub>=50V , L=0.1mH , R<sub>G</sub>=25Ω , V<sub>GS</sub>=10V
- 5.Guaranteed by design.

THIS PRODUCT IS SENSITIVE TO ELECTROSTATIC DISCHARGE, PLEASE HANDLE WITH CAUTION.

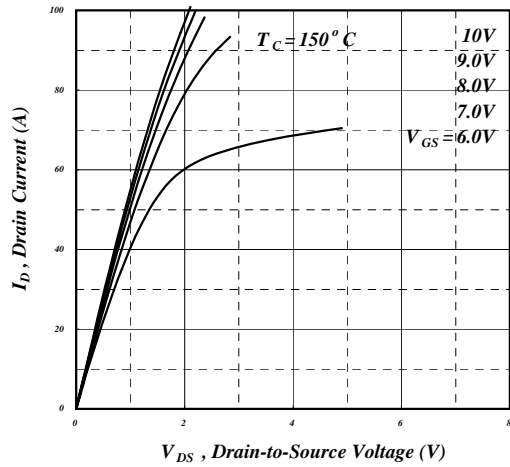
USE OF THIS PRODUCT AS A CRITICAL COMPONENT IN LIFE SUPPORT, AUTOMOTIVE OR OTHER SIMILAR SYSTEMS IS NOT AUTHORIZED.

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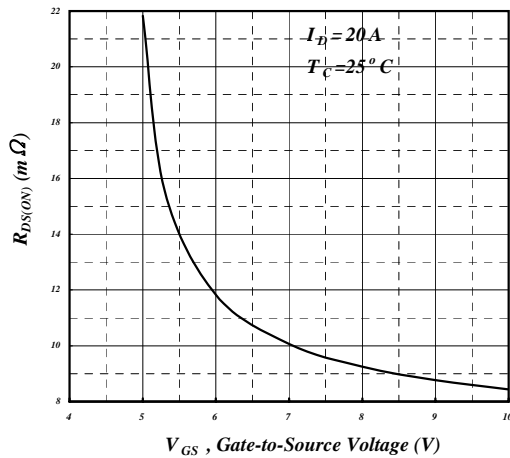
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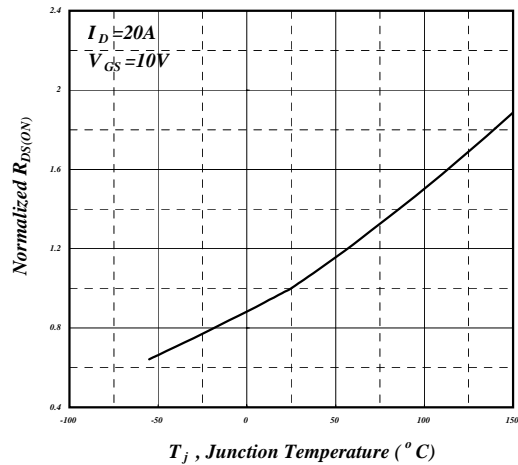
**Fig 1. Typical Output Characteristics**



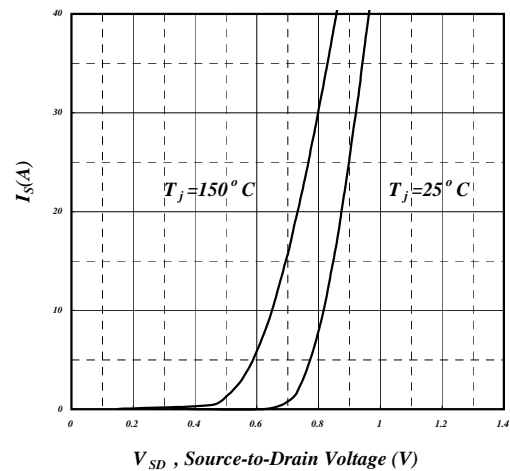
**Fig 2. Typical Output Characteristics**



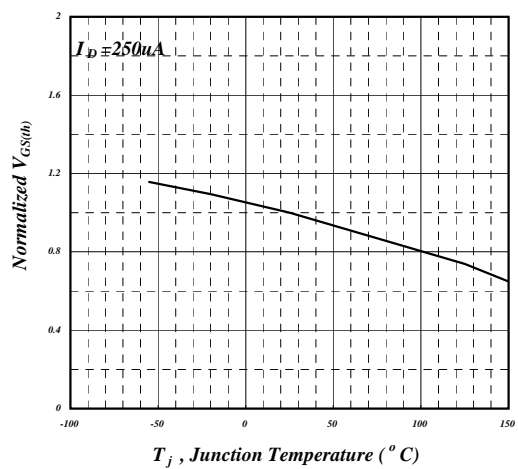
**Fig 3. On-Resistance v.s. Gate Voltage**



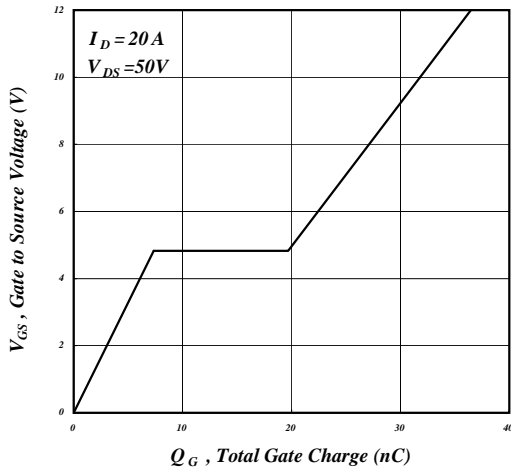
**Fig 4. Normalized On-Resistance v.s. Junction Temperature**



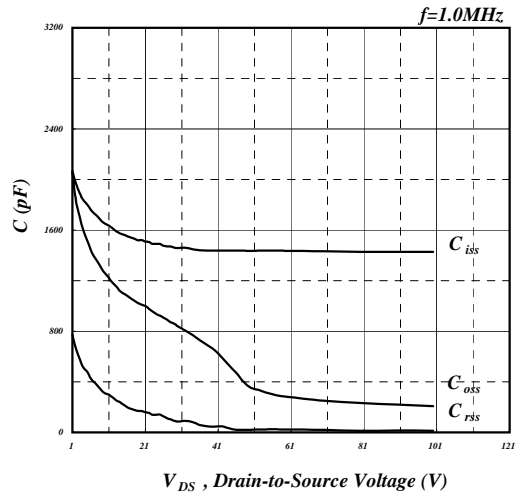
**Fig 5. Forward Characteristic of Reverse Diode**



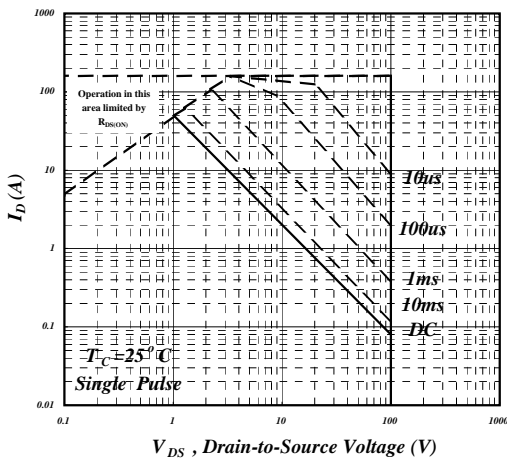
**Fig 6. Gate Threshold Voltage v.s. Junction Temperature**



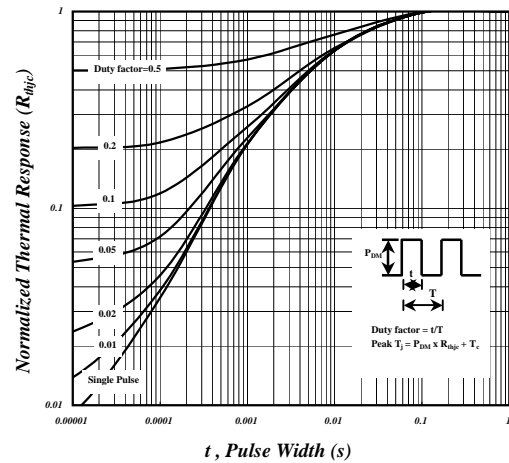
**Fig 7. Gate Charge Characteristics**



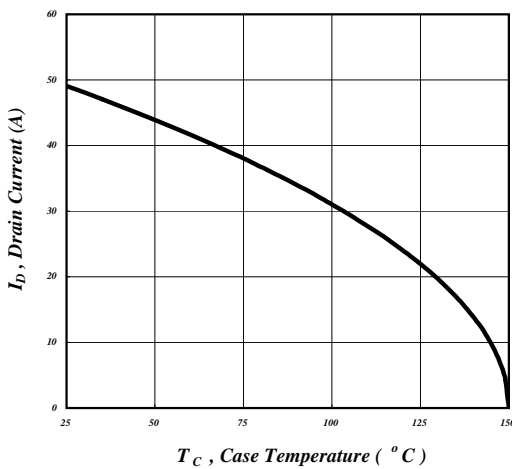
**Fig 8. Typical Capacitance Characteristics**



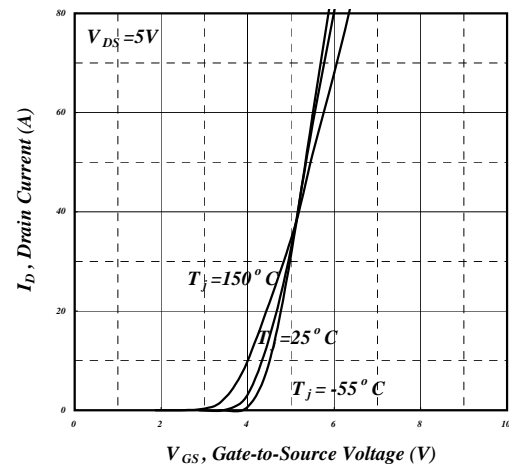
**Fig 9. Maximum Safe Operating Area**



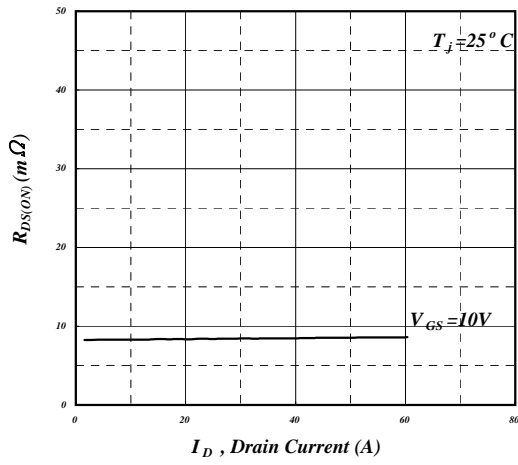
**Fig 10. Effective Transient Thermal Impedance**



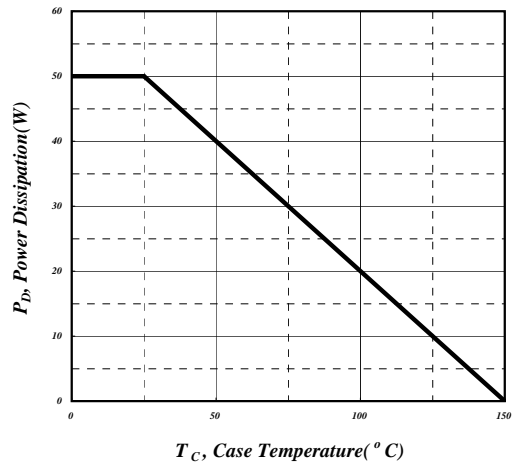
**Fig 11. Drain Current v.s. Case Temperature**



**Fig 12. Transfer Characteristics**



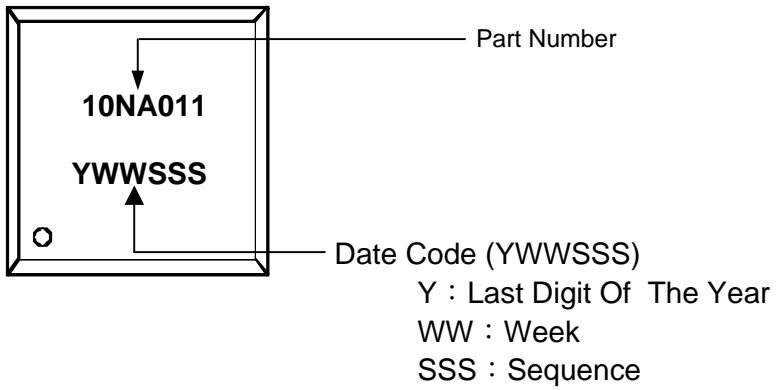
**Fig 13. Typ. Drain-Source on State Resistance**



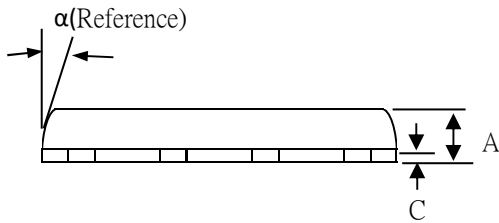
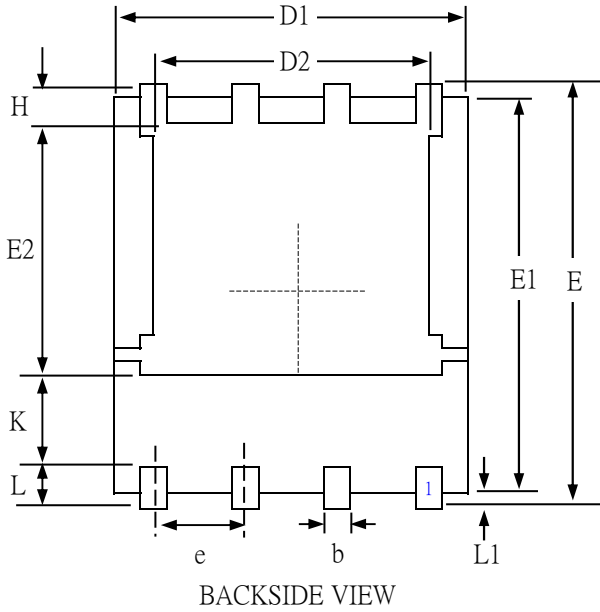
**Fig 14. Total Power Dissipation**

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**MARKING INFORMATION**



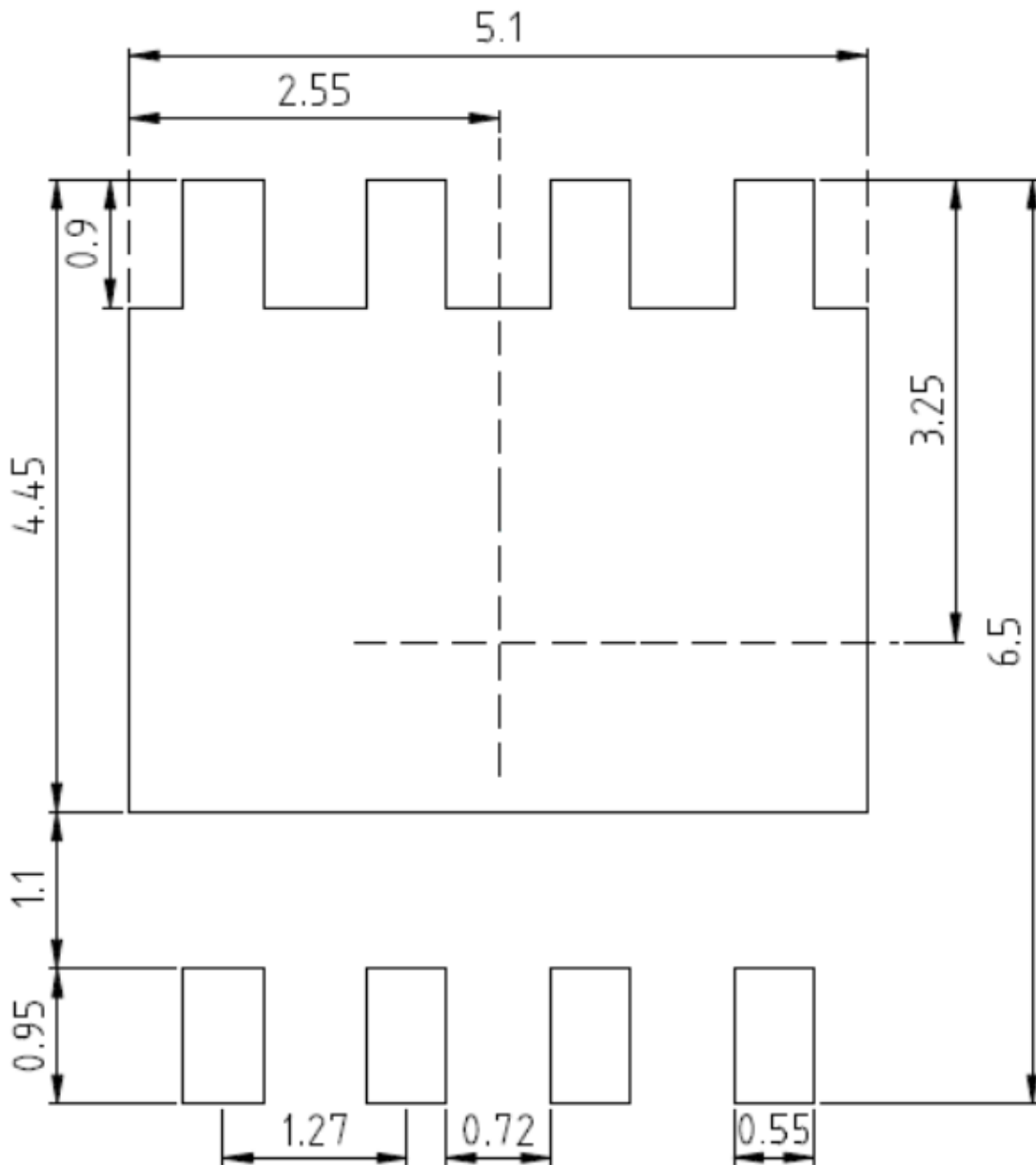
**Package Outline : PMPAK 5x6**



SYMBOLS	Millimeters		
	MIN	NOM	MAX
A	0.90	1.10	1.30
b	0.33	0.41	0.51
C	0.254(Ref.)		
D1	4.80	4.90	5.10
D2	3.61	4.00	4.40
E	5.80	6.03	6.25
E1 (Ref.)	5.60	5.75	5.90
E2 (Ref.)	3.30	3.55	3.80
e	1.27 BSC		
H	0.35	—	0.90
K (Ref.)	1.00	1.275	—
L	0.35	0.55	0.75
L1	0.06	0.13	0.20
$\alpha$ (Ref.)	0°	—	12°

- 1.All dimension are in millimeters.
- 2.Dimension does not include burrs and mold flash/protrusions.
- 3.The outline schematic is not to scale and slightly different from the actual product appearance.

**PMPAK 5X6(E-TYPE) FOOTPRINT :**



UNIT: mm