

1. Description

The AONR21307(ES) is P-Channel enhancement MOS Field Effect Transistor. Uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. Device is suitable for use in DC-DC conversion, power switch and charging circuit. Standard Product AONR21307(ES) is Pb-free.

2. Features

- -30V, $R_{DS(ON)}=8.0m\Omega(TYP.) @V_{GS}=-10V$
- $R_{DS(ON)}=11.5m\Omega(TYP.) @V_{GS}=-4.5V$
- Fast Switching
- High density cell design for low $R_{DS(on)}$
- Material: Halogen free
- Reliable and rugged
- Avalanche Rated
- Low leakage current

3. Applications

- PWM applications
- Load switch
- Power management in portable/desktop PCs
- DC/DC conversion

100% UIS TESTED!

4. Ordering Information

Part Number	Package	Marking	Material	Packing	Quantity per reel	Flammability Rating	Reel Sizes
AONR21307(ES)	PDFN3*3-8L	.ES3347/ LOT	Halogen free	Tape & Reel	5,000 PCS	UL 94V-0	13 inches

Table-1 Ordering information

5. Pin Configuration and Functions


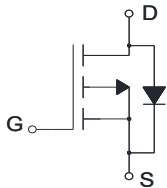
Pin	Function	Outline	Circuit Diagram
4	Gate	Note c 	
1/2/3	Source		
5/6/7/8	Drain		

Table-2 Pin configuration

6. Specification

Absolute Maximum Rating & Thermal Characteristics

Ratings at 25 °C ambient temperature unless otherwise specified.

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		BV_{DSS}	-30	V
Gate-Source Voltage		V_{GS}	±25	V
Continuous Drain Current	$T_C=25^\circ\text{C}$	I_D	-39	A
	$T_C=75^\circ\text{C}$		-30	
Maximum Power Dissipation	$T_C=25^\circ\text{C}$	P_D	30	W
	$T_C=75^\circ\text{C}$		17.8	
Pulsed Drain Current ^a		I_{DM}	-156	A
Avalanche Current, Single Pulsed ^b		I_{AS}	-25	A
Avalanche Energy, Single Pulsed ^b		E_{AS}	93.7	mJ
Operating Junction Temperature		T_J	150	°C
Storage Temperature Range		T_{stg}	-55 to +150	°C

Thermal resistance ratings

Parameter		Symbol	Typical	Unit
Junction-to-Ambient Thermal Resistance	$t \leq 10 \text{ s}$	$R_{\theta JA}$	40	°C/W
Junction-to-Case Thermal Resistance	Steady State	$R_{\theta JC}$	4.2	

Note:

- a: Repetitive rating, pulse width limited by junction temperature, $t_p=10\mu\text{s}$, Duty Cycle=1%.
- b: EAS condition: $T_J=25^\circ\text{C}$, $V_{DD}=-30\text{V}$, $V_G=-10\text{V}$, $L=0.3\text{mH}$, $R_g=25\Omega$.
- c: This diagram is only an electrical schematic, and the actual pin size is based on POD.

Electrical Characteristics

At TA = 25°C unless otherwise specified

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=-250\mu A$	-30			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-30V, V_{GS}=0V$			-1	μA
Gate-to-source Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 25V$			± 100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS}=V_{DS}, I_D=-250\mu A$	-1.0	-1.4	-2.0	V
Drain-to-source On-resistance	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-12A$		8	13	m Ω
		$V_{GS}=-4.5V, I_D=-7A$		11.5	18	
Forward Trans conductance	g_{FS}	$V_{DS}=-5.0V, I_D=-6A$		24	40	S
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C_{ISS}	$V_{GS}=0V, f=1MHz,$ $V_{DS}=-15V$		1780		pF
Output Capacitance	C_{OSS}			235		
Reverse Transfer Capacitance	C_{RSS}			200		
Gate Resistance	R_g	$f=1MHz$		2.5		Ω
Total Gate Charge	$Q_{G(TOT)}$	$V_{GS}=-10V, V_{DS}=-15V,$ $I_D=-20A$		46		nC
Gate-to-Source Charge	Q_{GS}			1.0		
Gate-to-Drain Charge	Q_{GD}			1.4		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$t_{d(ON)}$	$V_{GS}=-10V, V_{DS}=-15V,$ $R_L=1\Omega, R_G=3\Omega$		8		ns
Rise Time	t_r			27		
Turn-Off Delay Time	$t_{d(OFF)}$			68		
Fall Time	t_f			39		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=-1.0A$		-0.75	-1.5	V

7. Typical Characteristic

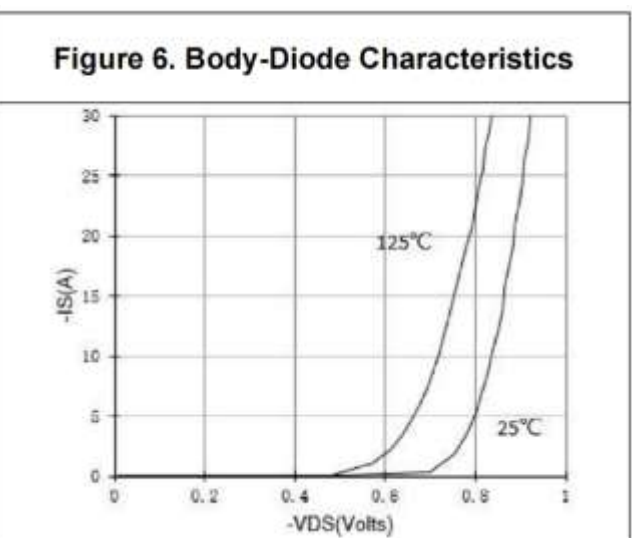
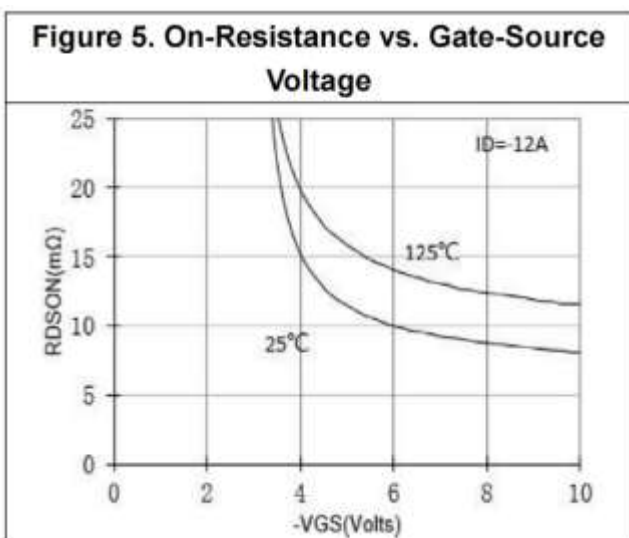
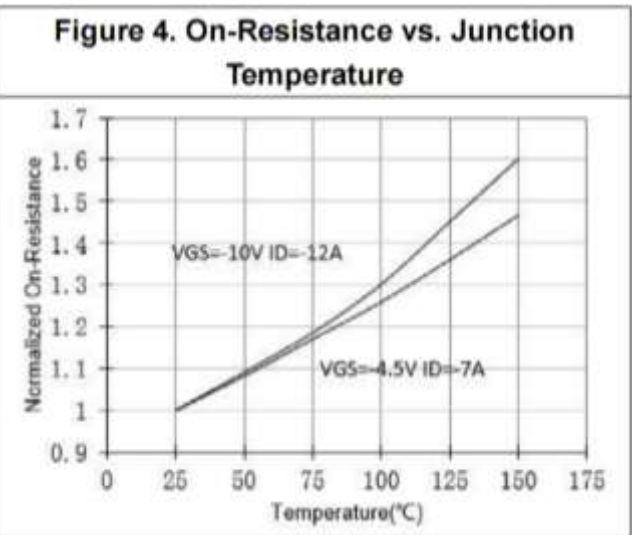
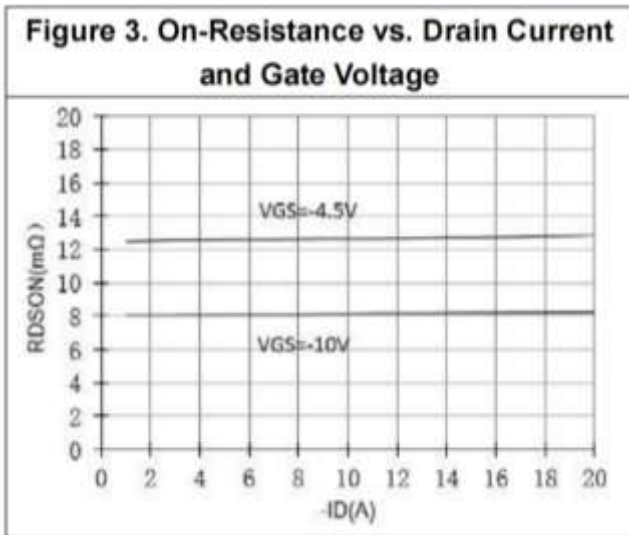
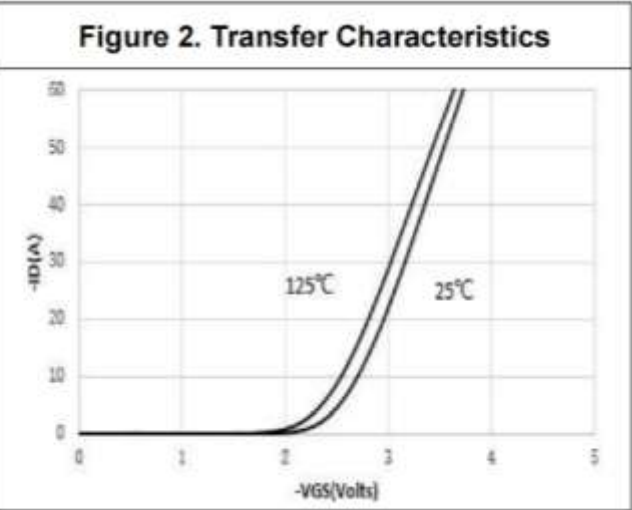
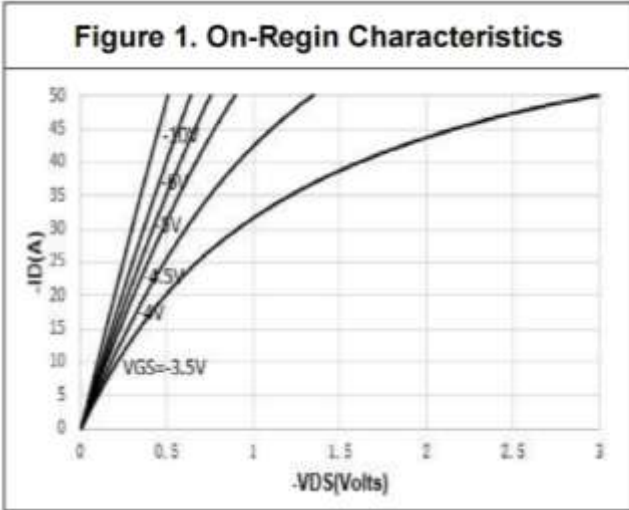
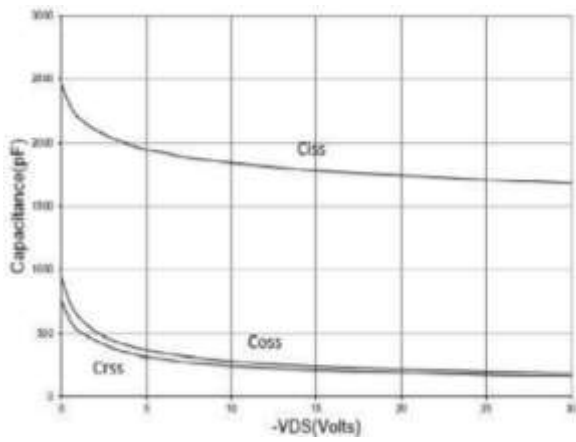
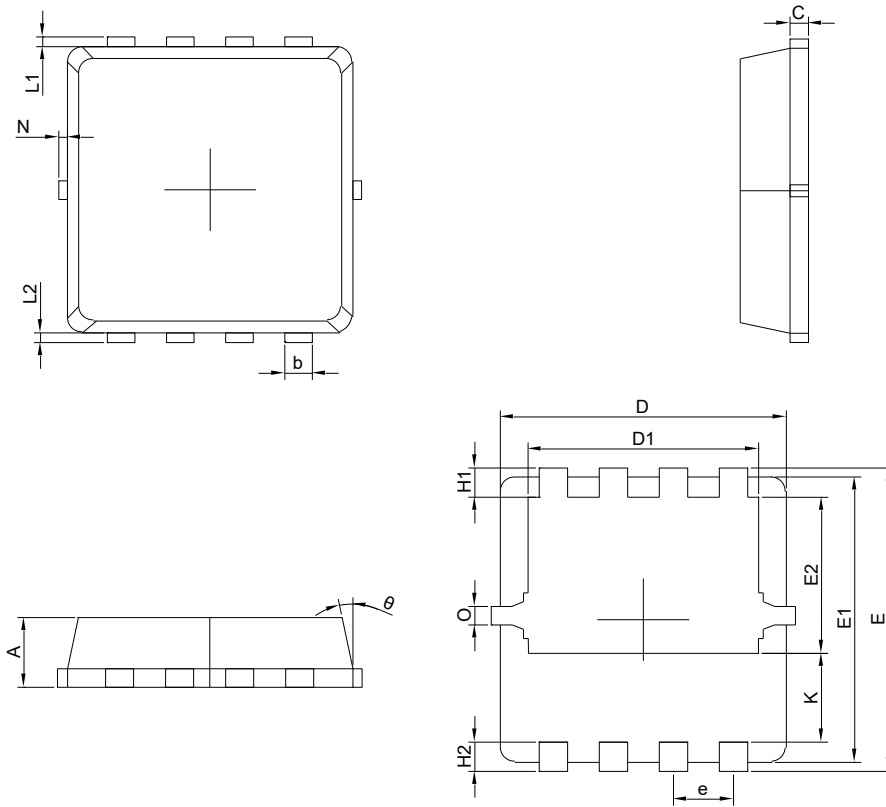


Figure 7. Capacitance Characteristics

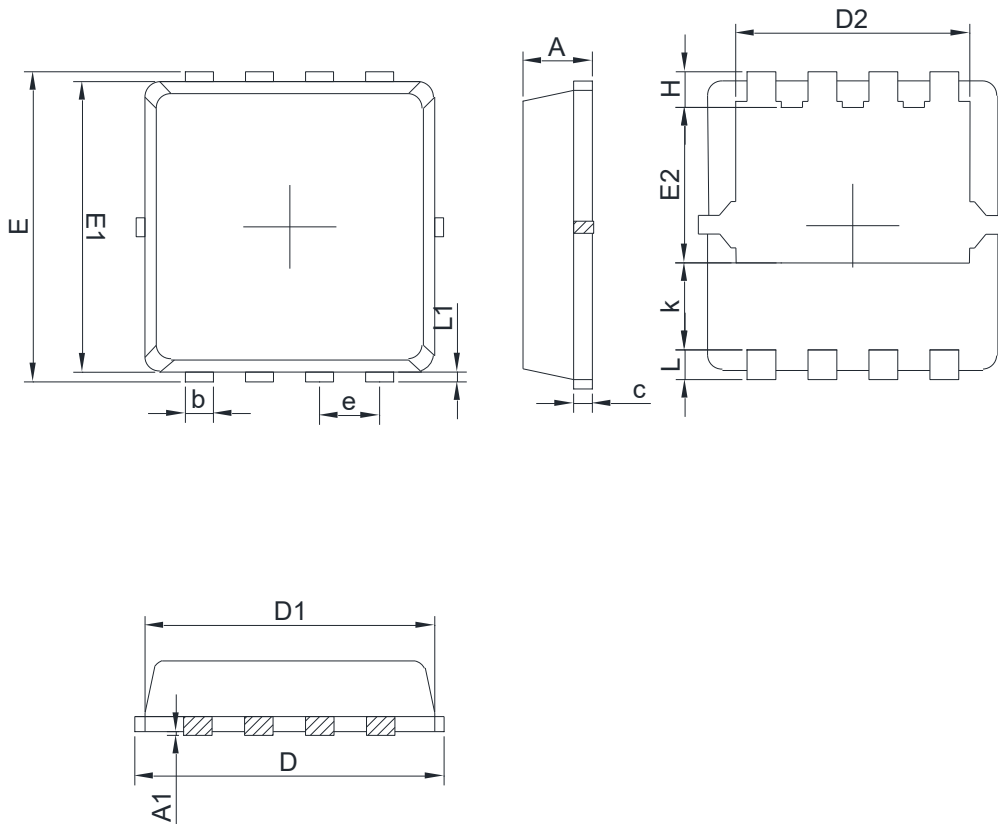
8. Dimension (PDFN3*3-8L)

POD A(J)



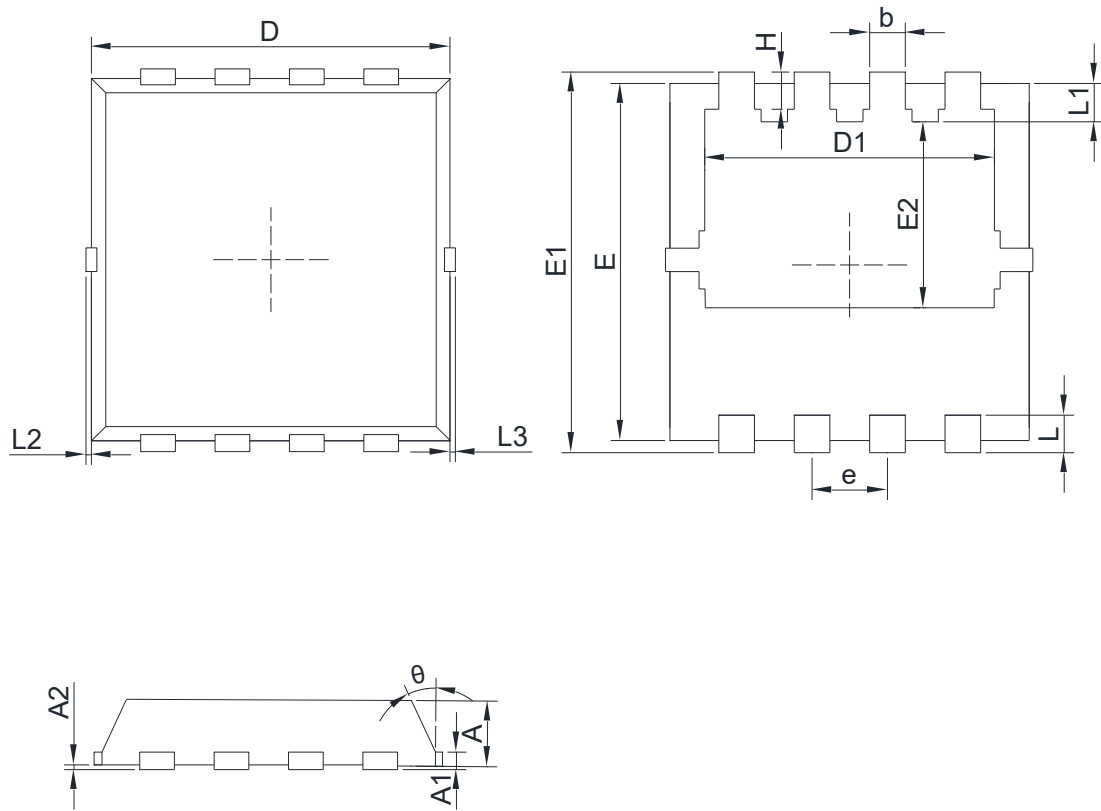
Symbol	Dimensions in Millimeters			Symbol	Dimensions in Millimeters		
	MIN	NOM	MAX		MIN	NOM	MAX
A	0.65	0.75	0.85	e	0.65 BSC.		
b	0.25	0.30	0.35	H1	0.21	0.31	0.41
C	0.15	0.20	0.25	H2	0.30	0.40	0.50
D	3.00	3.10	3.20	K	0.78	0.88	0.98
D1	2.40	2.50	2.60	L1/L2	0.10 REF.		
E	3.20	3.30	3.40	θ	11°	12°	13°
E1	3.00	3.10	3.20	N	0	-	0.15
E2	1.60	1.70	1.80	O	0.2 REF.		

POD B(Q)



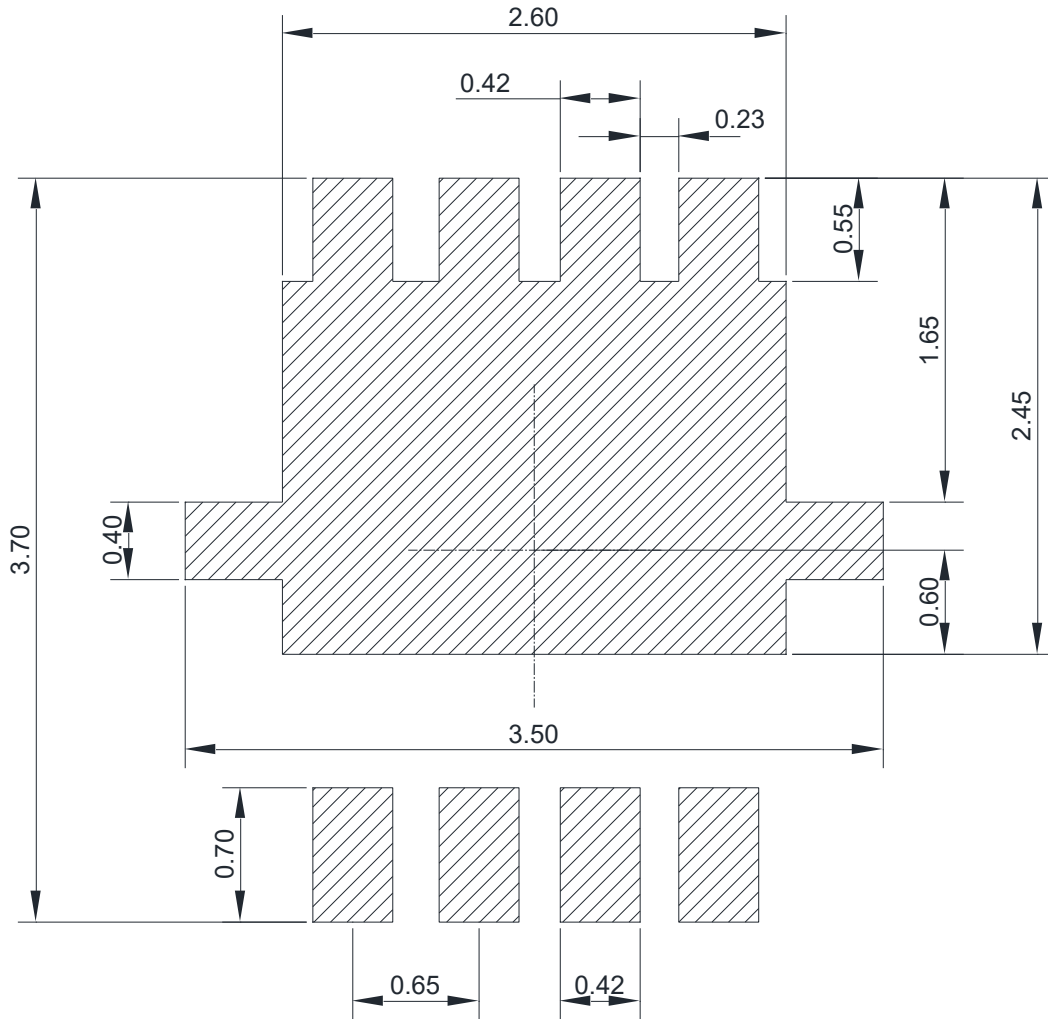
Symbol	Dimensions in Millimeters			Symbol	Dimensions in Millimeters		
	Min.	NOM.	Max.		Min.	NOM.	Max.
A	0.65	0.75	0.85	H	0.385	0.485	0.585
A1			0.05	k	0.80		
b	0.20	0.30	0.40	L	0.30	0.40	0.50
c	0.10	0.15	0.25	e	0.65BCS		
D	3.05	3.20	3.35	L1	0.025	0.125	0.225
D1	3.05	3.15	3.25	D2	2.30	2.45	2.60
E	3.25	3.35	3.45	E2	1.36	1.51	1.66
E1	3.00	3.10	3.20				

POD C(X)



COMMON DIMENSIONS CUNITS MEASURE=MILLIMETER							
SYMBOL	MIN	TYP	MAX	SYMBOL	MIN	TYP	MAX
A	0.700	0.800	0.900	L	0.300	0.400	0.500
A1	0.152 REF			L1	0.180	0.330	0.480
A2	0~0.05			L2	0~0.100		
D	3.000	3.100	3.200	L3	0~0.100		
D1	2.300	2.450	2.600	H	0.315	0.415	0.515
E	2.900	3.000	3.100	b	0.200	0.300	0.400
E1	3.150	3.300	3.450	e	0.550	0.650	0.750
E2	1.320	1.520	1.720	θ	8°	10°	12°

9. Recommended Soldering Footprint



DIMENSIONS: MILLIMETERS

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