SuperMOS – PDFN3*3-8L 100V BV_{DSS}, 12mΩ $R_{DS(ON)}$, N-channel MOSFET

1. Description

The ESGNH10R17 is N-Channel enhancement MOS Field Effect Transistor. Using advanced shielded gate 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 ESGNH10R17 is Pb-free.

2. Features

- 100V, $R_{DS(ON)}$=12.0mΩ(Typ.) @V_{GS}=10V
  $R_{DS(ON)}$=14.5mΩ(Typ.) @V_{GS}=4.5V
- High density cell design for low $R_{DS(on)}$
- Material: Halogen free
- Reliable and rugged
- Avalanche Rated
- Low leakage current

3. Applications

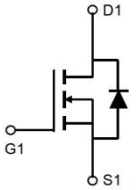
- PWM applications
- Load switch
- Power management in portable/desktop PCs
- DC/DC conversion

100% UIS TESTED

4. Ordering Information

Part Number	Package	Marking	Material	Packing	Quantity per reel	Flammability Rating	Reel Size
ESGNH10R17	PDFN3*3-8L	GNH10R17/LOT	Halogen free	Tape & Reel	5,000 PCS	UL 94V-0	13 inches

5. Pin Configuration and Functions

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

6. Specification

Absolute Maximum Rating & Thermal Characteristics

Ratings at 25 ℃ ambient temperature unless otherwise specified.

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		BV_{DSS}	100	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_C=25°C	I_D	46	A
	T_C=100°C		29	
Maximum Power Dissipation		P_D	71.4	W
Pulsed Drain Current		I_{DM}	184	A
Avalanche Current, Single Pulsed [a]		I_{AS}	20	A
Avalanche Energy, Single Pulsed [a]		E_{AS}	80	mJ
Operating Junction Temperature		T_J	150	°C
Lead Temperature		T_L	260	°C
Storage Temperature Range		T_{stg}	-55 to 150	°C

Thermal resistance ratings

Single Operation				
Parameter	Symbol	Typical	Maximum	Unit
Junction-to-Case Thermal Resistance	$R_{\theta JC}$		1.75	°C/W

Note:

a: Tj=25℃,V_{DD}=25V, V_G=10V, L=0.4mH,Rg=25Ω

b: This diagram is only an electrical schematic, and the actual pin size is based on POD

Electrical Characteristics

At TA = 25℃ 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=250uA	100			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=100V, V_{GS}=0V			1	uA
Gate-to-source Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS}=V_{DS}, I_D=250uA	1.0	1.7	2.5	V
Drain-to-source On-resistance	$R_{DS(on)}$	V_{GS}=10V, I_D=20A		12	17	mΩ
		V_{GS}=4.5V, I_D=10A		14.5	20	
Forward transconductance	g_{fs}	V_{DS}=10V, I_D=20A			100	S
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C_{ISS}	V_{GS}=0V, f=1MHz, V_{DS}=50V		1210		pF
Output Capacitance	C_{OSS}			145		
Reverse Transfer Capacitance	C_{RSS}			12		
Total Gate Charge	$Q_{G(TOT)}$	V_{GS}=10V, V_{DS}=50V, I_D=20A		23		nC
Gate-to-Source Charge	Q_{GS}			3		
Gate-to-Drain Charge	Q_{GD}			5		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$t_{d(ON)}$	V_{GS}=10V, V_{DS}=50V, I_D=20A, R_G=3Ω		9.5		ns
Rise Time	t_r			3.6		
Turn-Off Delay Time	$t_{d(OFF)}$			25.6		
Fall Time	t_f			4.5		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V_{SD}	V_{GS}=0V, I_S=20A			1.5	V

7. Typical Characteristic

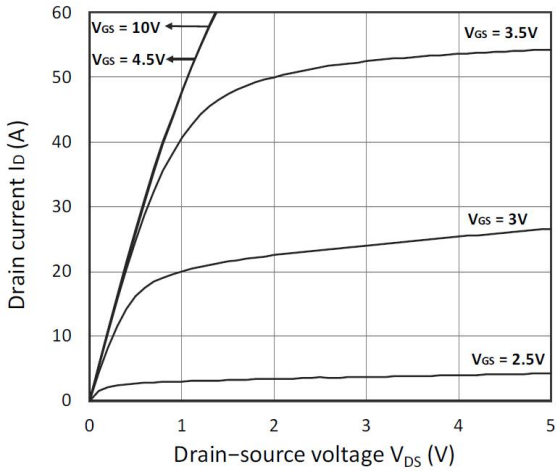


Figure 1. Output Characteristics

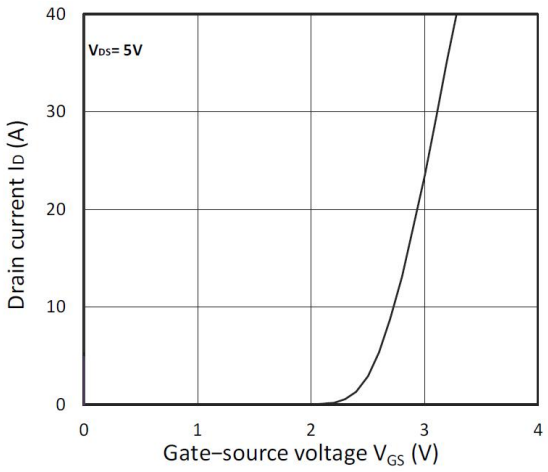


Figure 2. Transfer Characteristics

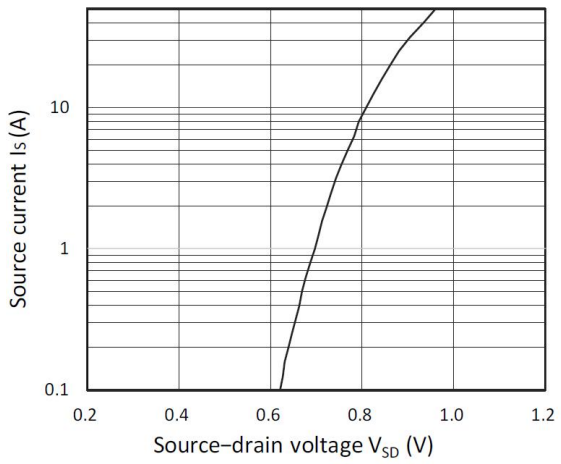


Figure 3. Forward Characteristics of Reverse

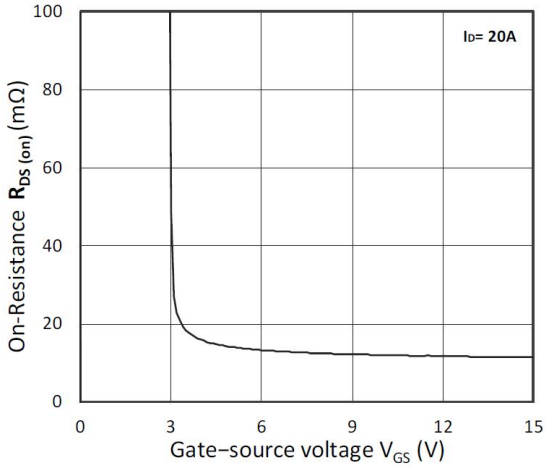


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

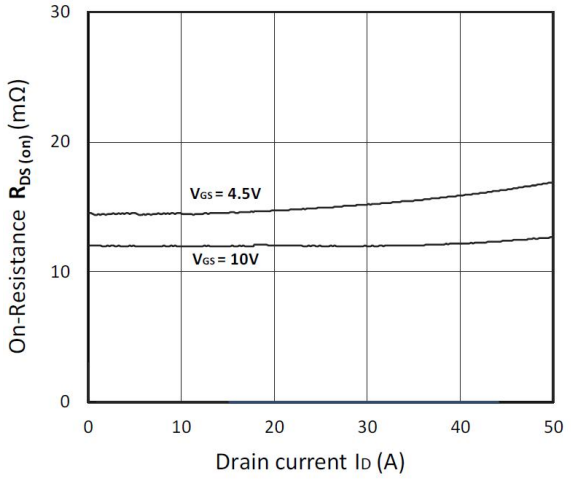


Figure 5. $R_{DS(ON)}$ vs. I_D

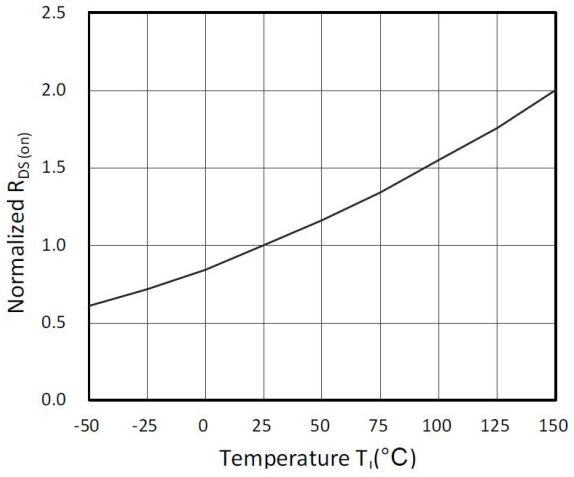


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

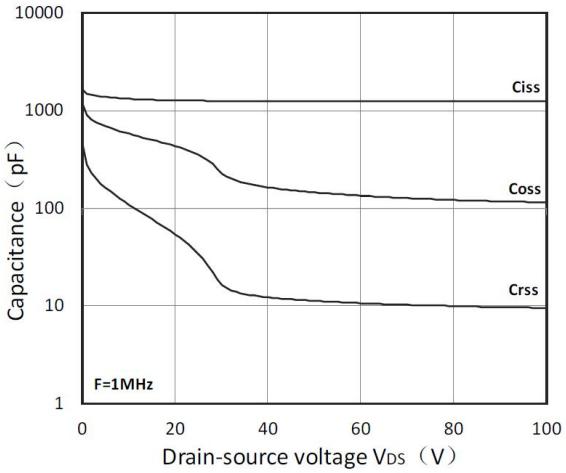
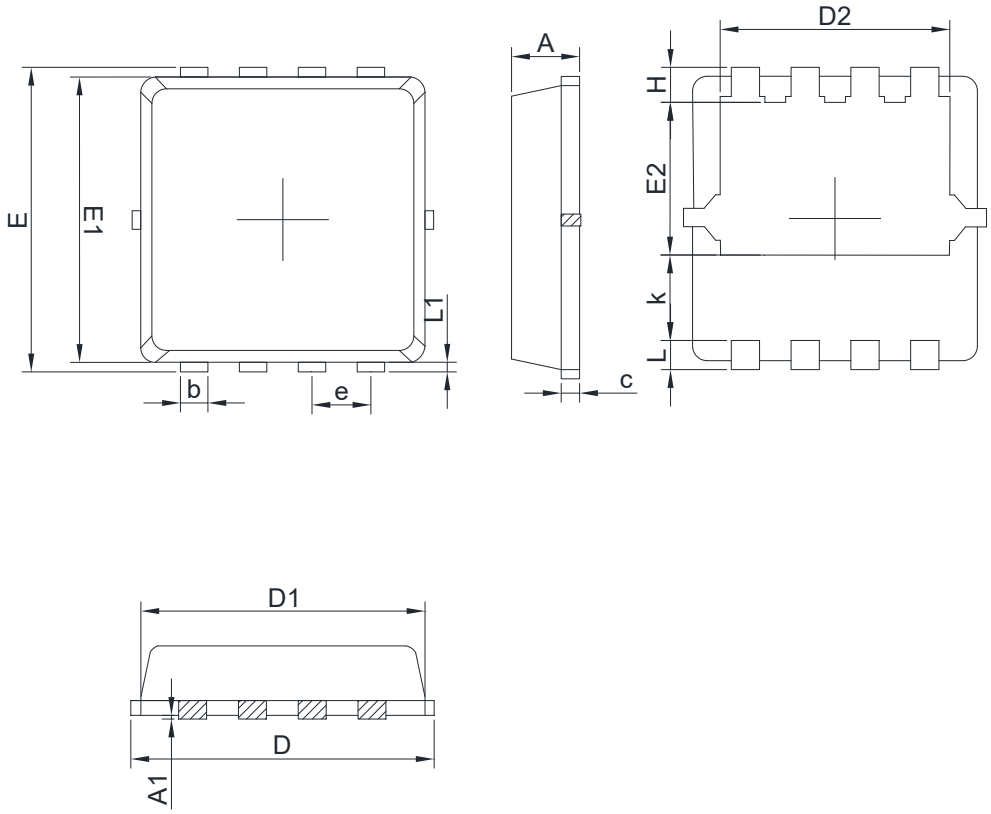


Figure 7. Capacitance Characteristics

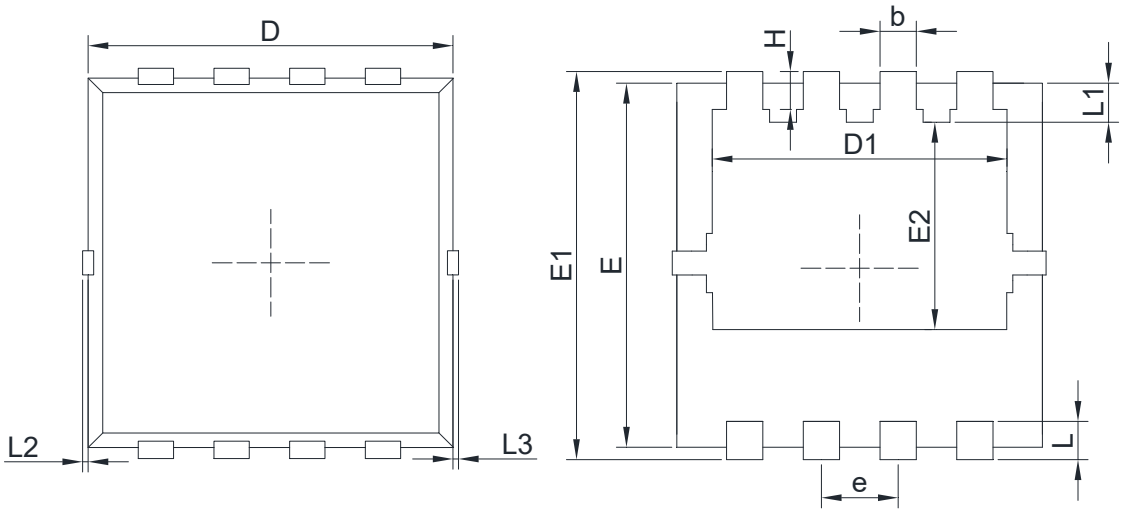
8. Dimension (PDFN3*3-8L)

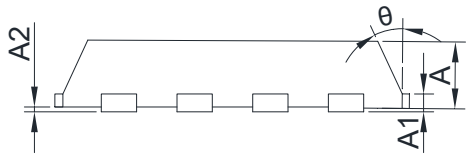
POD A(Q)



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	0.30		
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	1.55	1.70	1.85
E1	3.00	3.10	3.20				

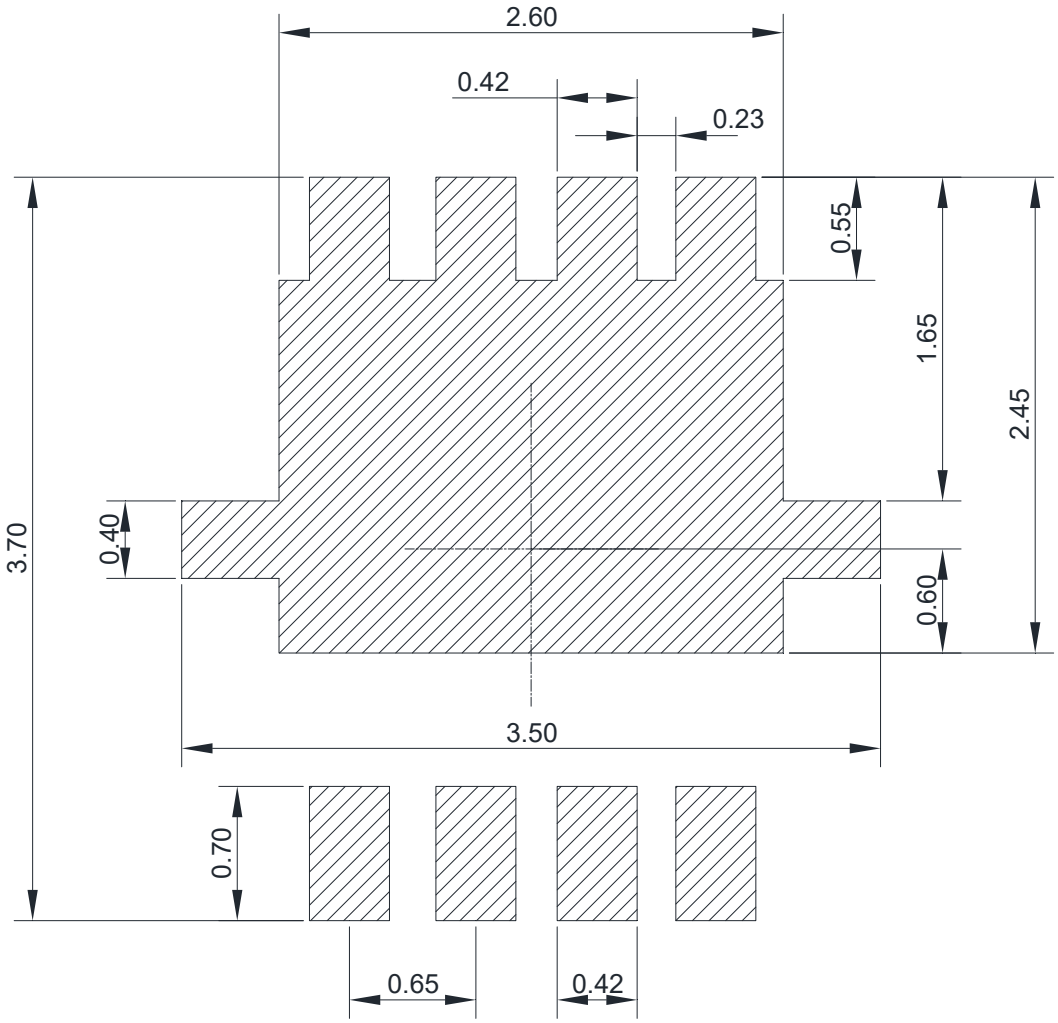
POD B(X)





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	1.535	1.735	1.935	θ	8°	10°	12°

9. Recommended Soldering Footprint



DIMENSIONS: MILLIMETERS

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