

1. Description

The SI7615ADN-T1-GE3(ES) uses advanced trench technology MOSFETs to provide excellent $R_{DS(ON)}$ and low gate charge. Device is suitable for use in DC-DC conversion, power switch and charging circuit. Standard Product SI7615ADN-T1-GE3(ES) is Pb-free.

2. Features

- -20V $R_{DS(ON)}=5m\Omega(Typ.) @V_{GS}=-4.5V$
- $R_{DS(ON)}=7m\Omega(Typ.) @V_{GS}=-2.5V$
- Fast Switching
- High density cell design for low $R_{DS(on)}$
- Material: Halogen free
- Reliable and rugged
- Avalanche Rated
- Low leakage current

3. Applications

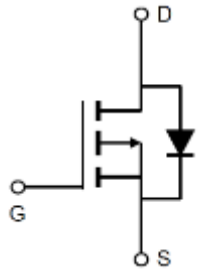
- PWM applications
- Load switch
- Power management in portable/desktop PCs
- DC/DC conversion

100% UIS TESTED

4. Ordering Information

Part Number	Package	Marking	Material	Packing	Quantity per reel	Flammability Rating	Reel Size
SI7615ADN-T1-GE3(ES)	PDFN3*3-8L	.PH02R065/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		
1/2/3	Source		
5/6/7/8	Drain		

6. Specification

Absolute Maximum Rating & Thermal Characteristics

Ratings at 25 °C ambient temperature unless otherwise specified.

Parameter		Symbol	Limited	Unit
Drain-Source Voltage		BV_{DSS}	-20	V
Gate-Source Voltage		V_{GS}	±12	V
Continuous Drain Current	$T_C=25^{\circ}C$	I_D	-55	A
	$T_C=100^{\circ}C$		-33	
Maximum Power Dissipation	$T_C=25^{\circ}C$	P_D	28	W
Pulsed Drain Current		I_{DM}	-220	A
Single Pulse Avalanche Current ^a		I_{AS}	-13	A
Single Pulse Avalanche Energy ^a		E_{AS}	40	mJ
Operating Junction Temperature		T_J	-55 to +150	°C
Storage Temperature Range		T_{stg}	-55 to +150	°C

Thermal resistance ratings

Parameter	Symbol	Typical	Maximum	Unit
Junction-to-Case Thermal Resistance	$R_{\theta JC}$		4.4	°C/W

Notes:

a: The EAS test conditions: $V_{DD}=-10V$, $V_{GS}=-10V$, $L=0.5mH$, $R_G=25\Omega$, $T_J=25^{\circ}C$.

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 =-250uA	-20			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{GS} =0V, V _{DS} =-20V			-1.0	uA
Gate-to-source Leakage Current	I _{GSS}	V _{GS} =±12V, V _{DS} =0V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{GS} =V _{DS} , I _D =-250uA	-0.4	-0.65	-1	V
Drain-to-source On-resistance	R _{DS(on)}	V _{GS} =-4.5V, I _D =-15A		5	6.5	mΩ
		V _{GS} =-2.5V, I _D =-12A		7	9	
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C _{ISS}	V _{GS} =0V, V _{DS} =-10V f=1MHz		3460		pF
Output Capacitance	C _{OSS}			545		
Reverse Transfer Capacitance	C _{RSS}			490		
Total Gate Charge	Q _{G(TOT)}	V _{GS} =0 to -4.5V, V _{DS} =-4.5V, I _D =-15A		58		nC
Gate-to-Source Charge	Q _{GS}			7		
Gate-to-Drain Charge	Q _{GD}			15		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	t _{d(ON)}	V _{GS} =-10V, V _{DS} =-10V I _D =-13A, R _G =2.7Ω		13		ns
Rise Time	t _r			108		
Turn-Off Delay Time	t _{d(OFF)}			160		
Fall Time	t _f			155		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V _{SD}	V _{GS} =0V, I _{SD} =-15A			-1.2	V

7. Typical Characteristic

Figure 1: Output Characteristics

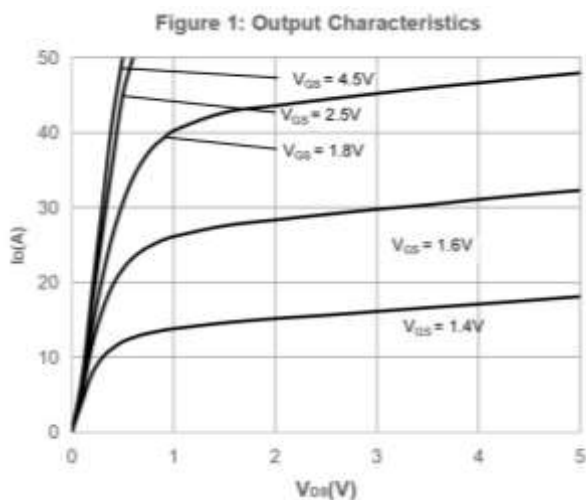


Figure 2: Typical Transfer Characteristics

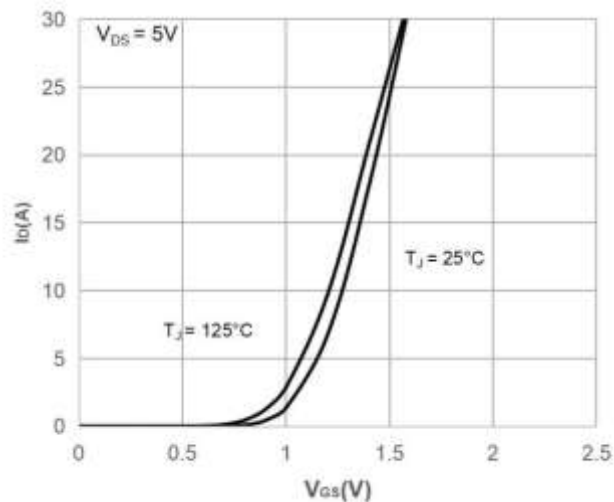


Figure 3: On-resistance vs. Drain Current

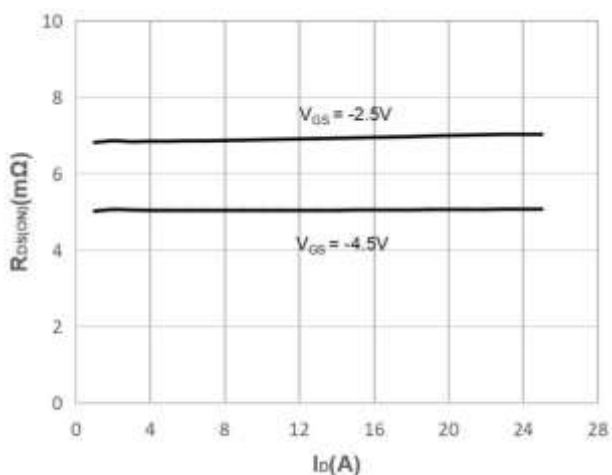


Figure 4: Body Diode Characteristics

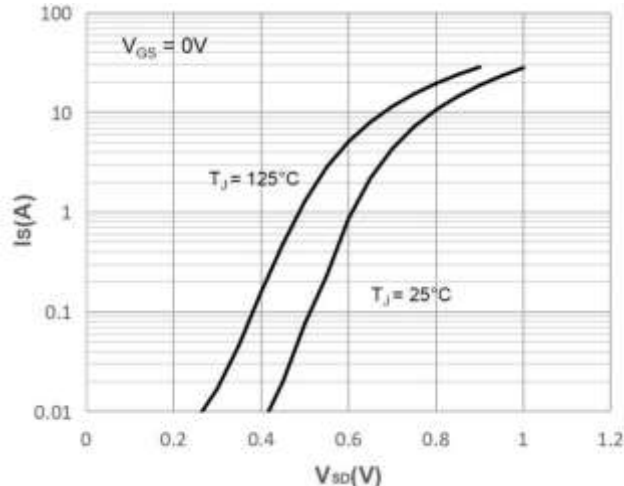


Figure 5: Capacitance Characteristics

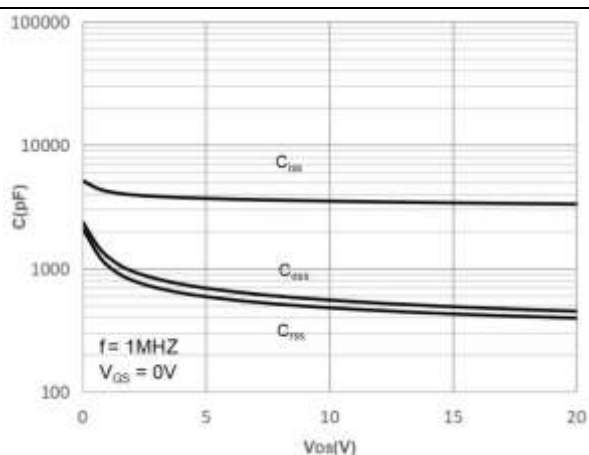
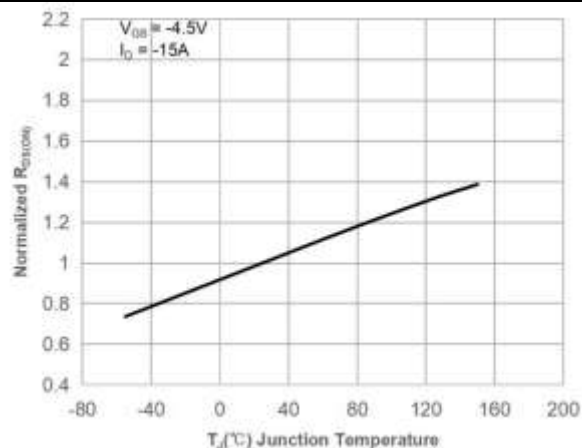
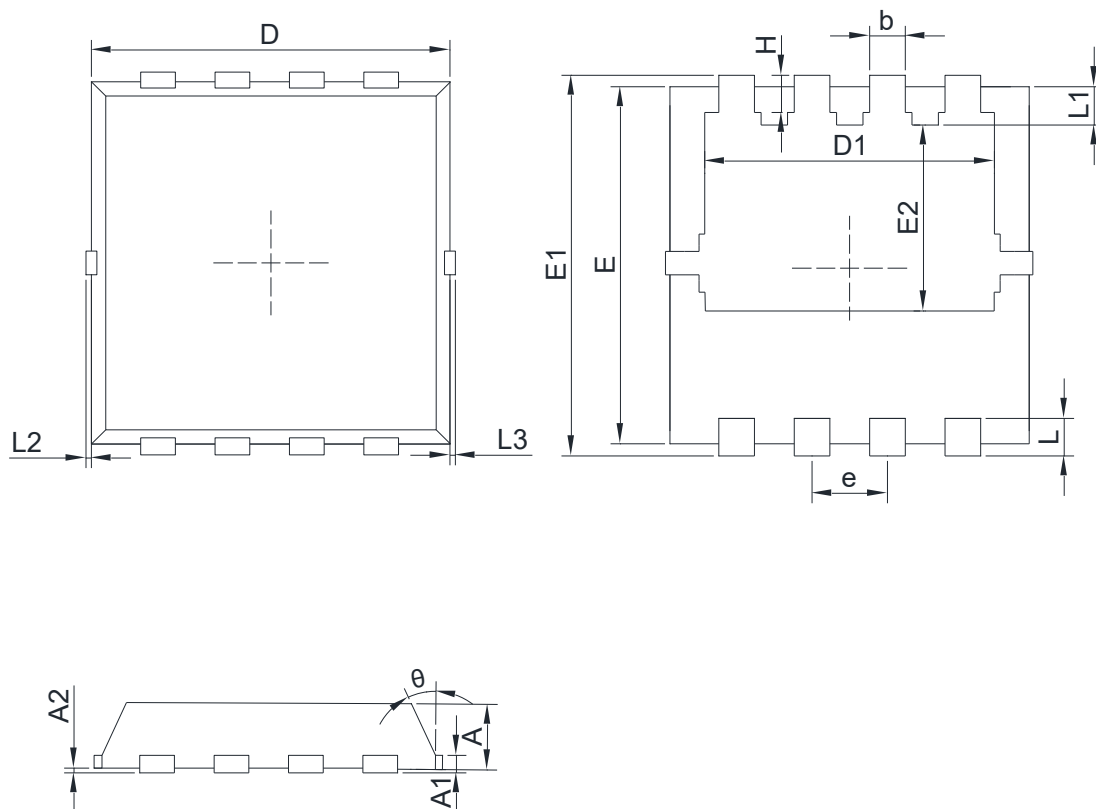


Figure 6: Normalized on Resistance vs. Junction Temperature



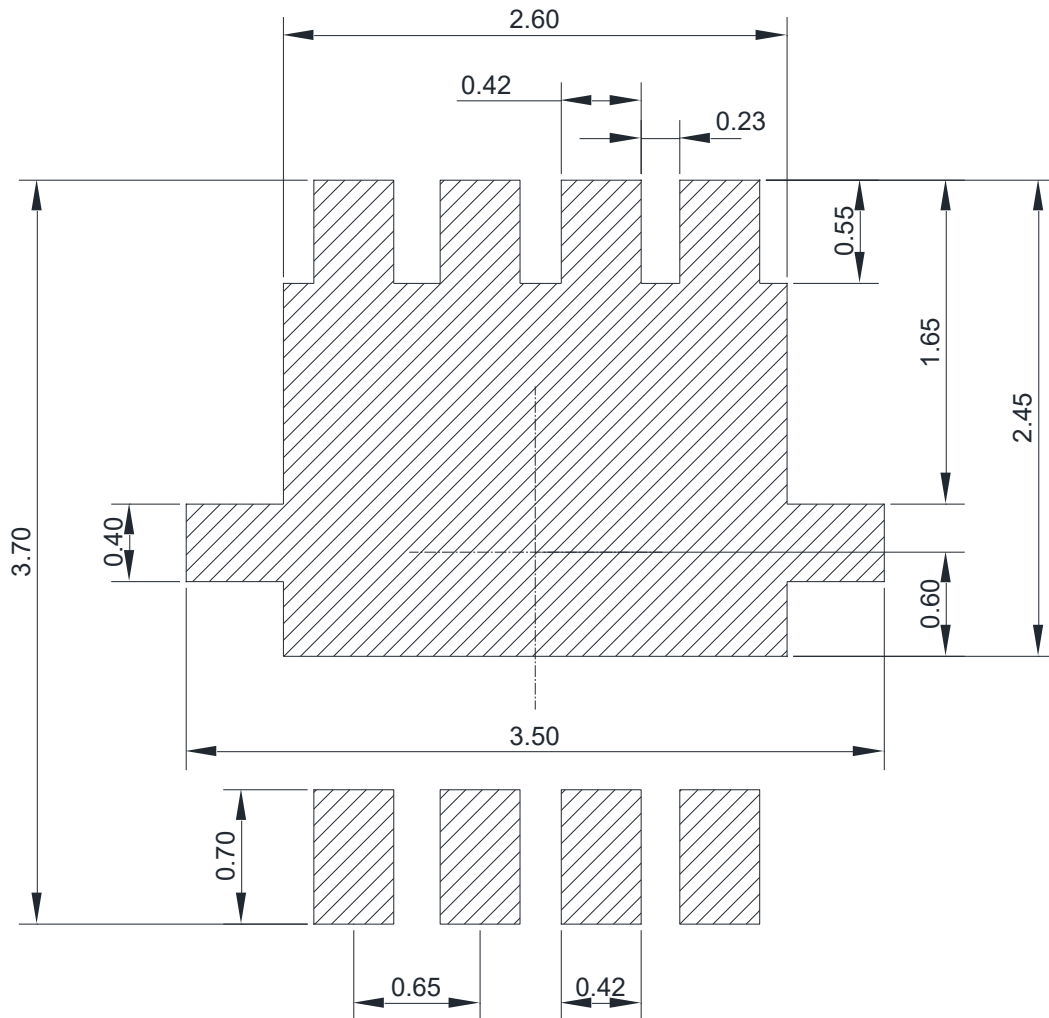
8. Dimension (PDFN3*3-8L)

POD (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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