

SuperMOS – PDFN5*6-8L 100V BV_{DSS} , 91m Ω $R_{DS(ON)}$, 11A I_D N-channel MOSFET

1. Description

The ESN6484 is N-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 ESN6484 is Pb-free.

2. Features

- 100V, $R_{DS(ON)}=91m\Omega(Tpy)$, $V_{GS}=10V$
 $R_{DS(ON)}=97m\Omega(Tpy)$, $V_{GS}=4.5V$
- Use trench MOSFET technology
- High density cell design for low $R_{DS(on)}$
- Material: Halogen free
- Reliable and rugged
- Avalanche Rated
- Low leakage current

3. Applications


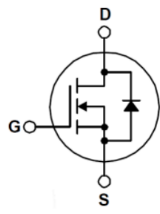
- PWM applications
- Load switch
- Power management in portable/desktop PCs
- DC/DC conversion

100% UIS TESTED!

4. Ordering Information

Part Number	Package	Marking	Material	Packing	Quantity per reel	Flammability Rating	Reel Size
ESN6484	PDFN5*6-8L	ESN6484/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	Drain		
5/6/7/8	Source		

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}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	$T_C=25^\circ C$	11
		$T_C=75^\circ C$	9
Maximum Power Dissipation	P_D	$T_C=25^\circ C$	25
		$T_C=75^\circ C$	15
Pulsed Drain Current ^a	I_{DM}	44	A
Avalanche Current, Single Pulsed ^b	I_{AS}	12.5	A
Avalanche Energy, Single Pulsed ^b	E_{AS}	23.4	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-Ambient Thermal Resistance	$t \leq 10$ s	$R_{\theta JA}$	21	25	°C/W
Junction-to-Case Thermal Resistance ^c	Steady State	$R_{\theta JC}$	3.5	5	

Note:

a: Repetitive rating, pulse width limited by junction temperature, $t_p=10\mu s$, Duty Cycle=1%

b: EAS condition: $T_J=25^\circ C, V_{DD}=50V, V_G=10V, L=0.3mH, R_g=25\Omega$

c: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

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}	$V_{GS}=0V, I_D=250\mu A$	100			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=100V, V_{GS}=0V$			1	μA
Gate-to-source Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	1.0	1.8	3.0	V
Drain-to-source On-resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=7.5A$		91	122	m Ω
		$V_{GS}=4.5V, I_D=5A$		97	142	
Forward Trans conductance	g_{FS}	$V_{DS}=5.0V, I_D=7.5A$			40	S
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C_{ISS}	$V_{GS}=0V, f=1MHz, V_{DS}=50V$		780		pF
Output Capacitance	C_{OSS}			58		
Reverse Transfer Capacitance	C_{RSS}			26		
Total Gate Charge	$Q_{G(TOT)}$	$V_{GS}=4.5V, V_{DS}=50V, I_D=7.5A$		19.2		nC
Gate-to-Source Charge	Q_{GS}			3.5		
Gate-to-Drain Charge	Q_{GD}			5.3		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$t_{d(ON)}$	$V_{GS}=10V, V_{DS}=50V, R_L=6\Omega, R_G=3\Omega$		6		ns
Rise Time	t_r			2.6		
Turn-Off Delay Time	$t_{d(OFF)}$			22		
Fall Time	t_f			2.5		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=1A$		0.7	1.2	V

7. Typical Characteristic

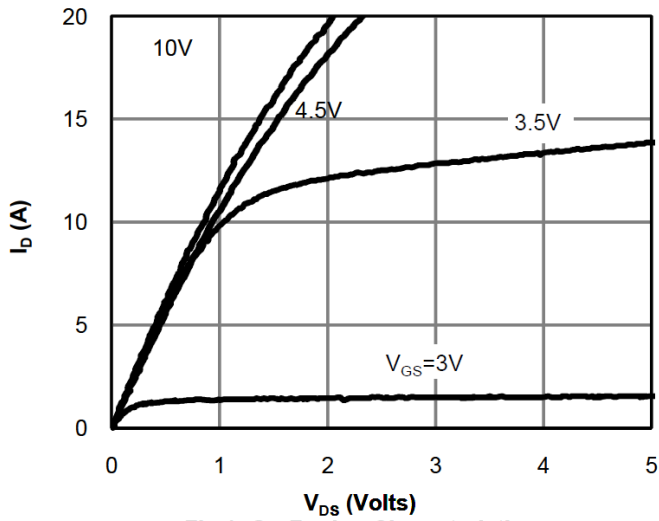


Fig 1: On-Region Characteristics

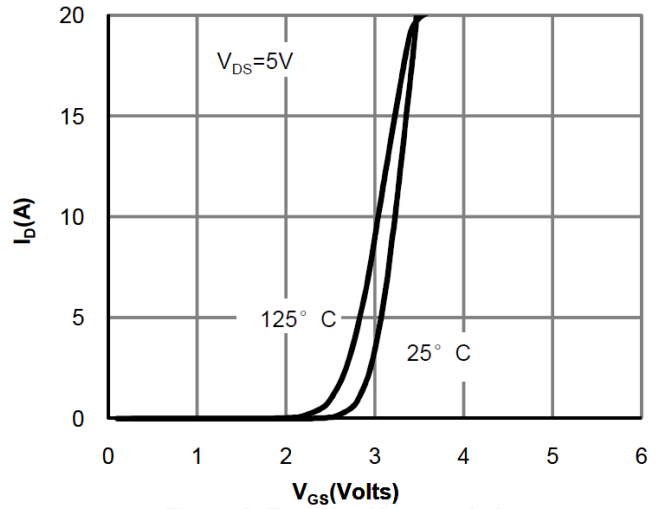


Figure 2: Transfer Characteristics

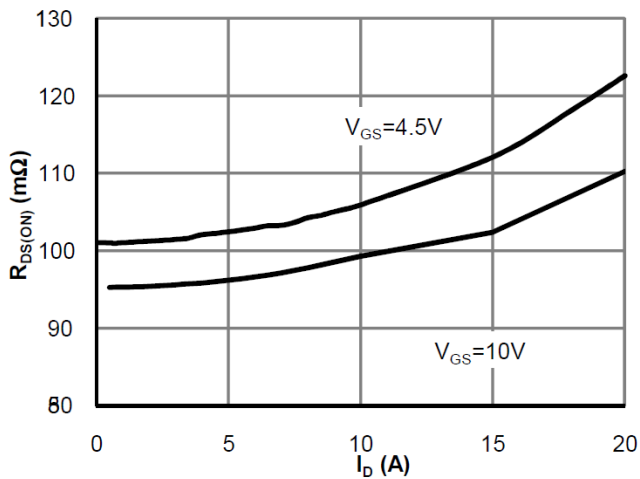


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

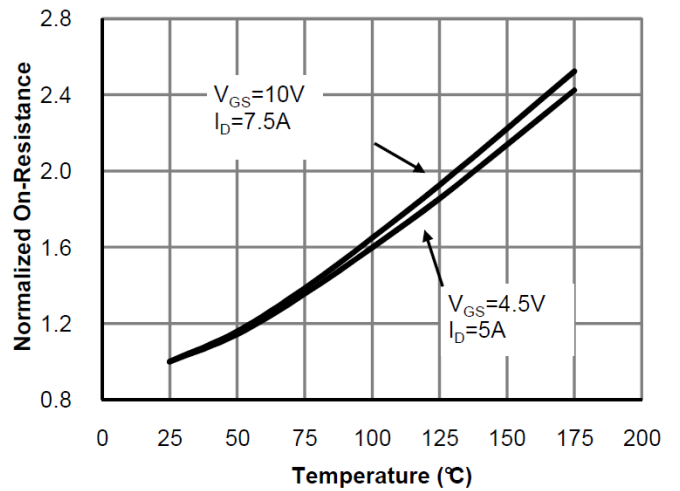


Figure 4: On-Resistance vs. Junction Temperature

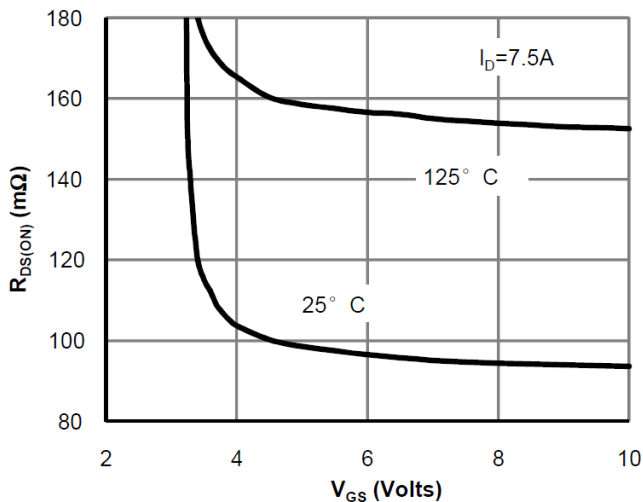


Figure 5: On-Resistance vs. Gate-Source Voltage

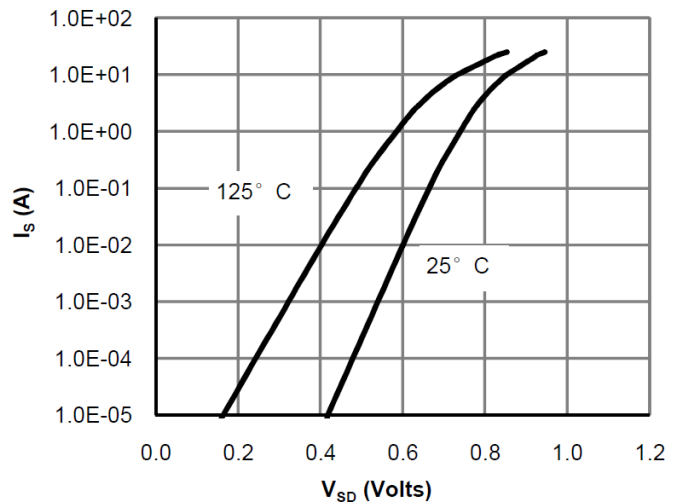


Figure 6: Body-Diode Characteristics

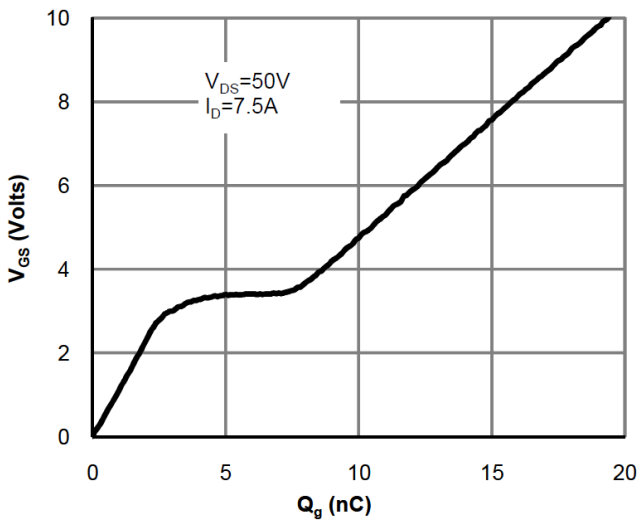


Figure 7: Gate-Charge Characteristics

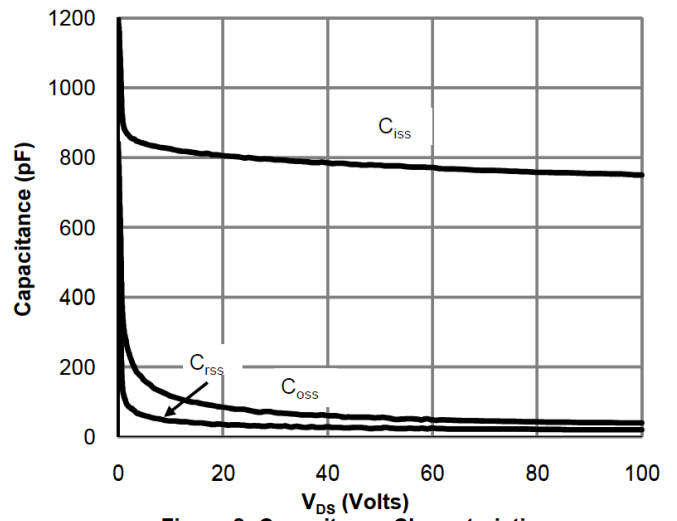


Figure 8: Capacitance Characteristics

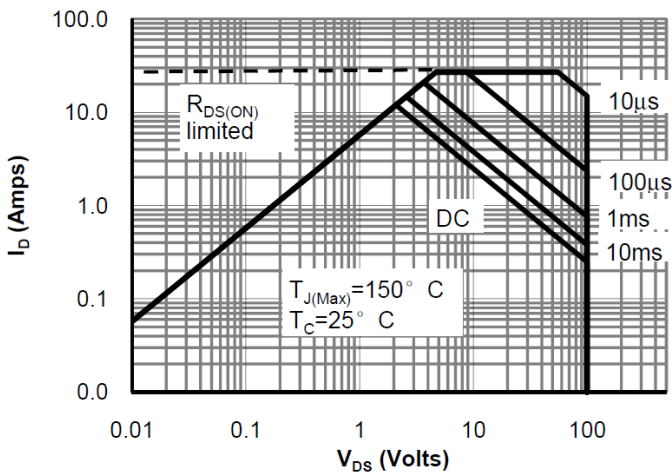


Figure 9: Maximum Forward Biased Safe Operating Area

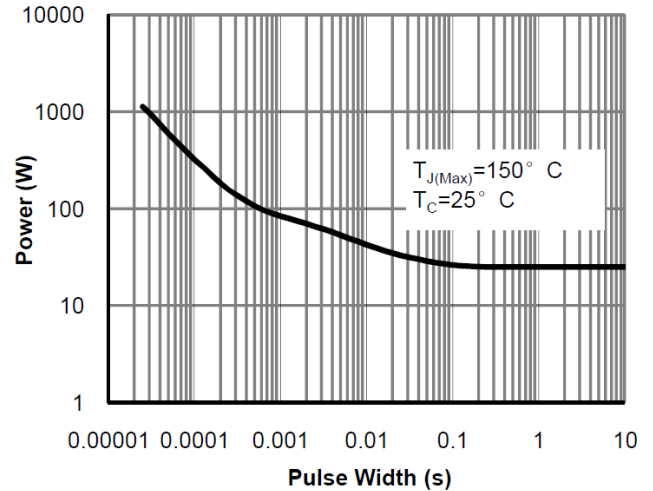


Figure 10: Single Pulse Power Rating Junction-to-Case

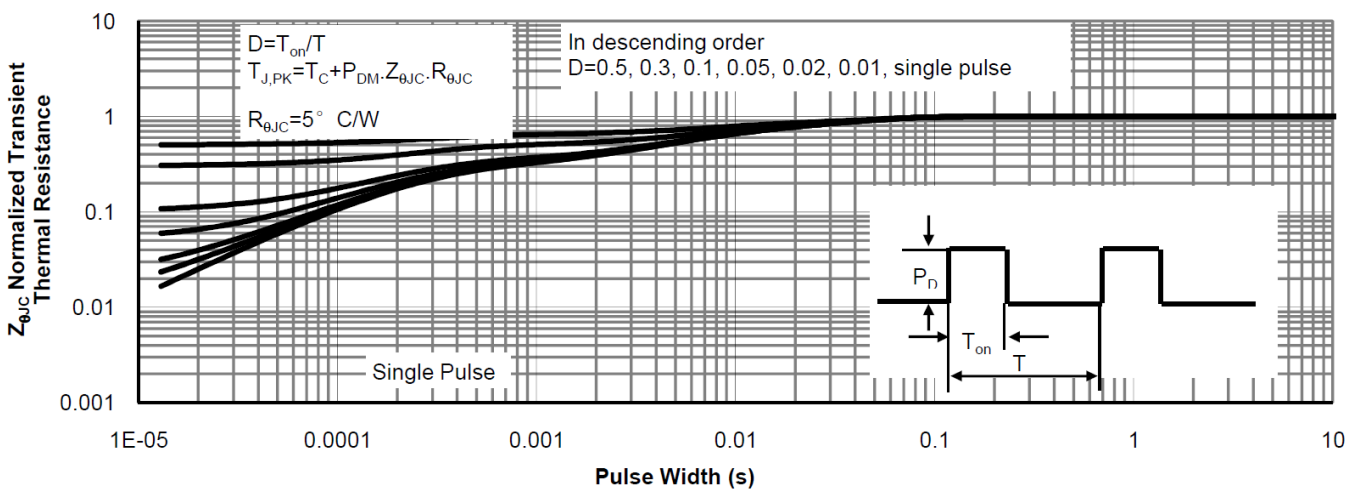
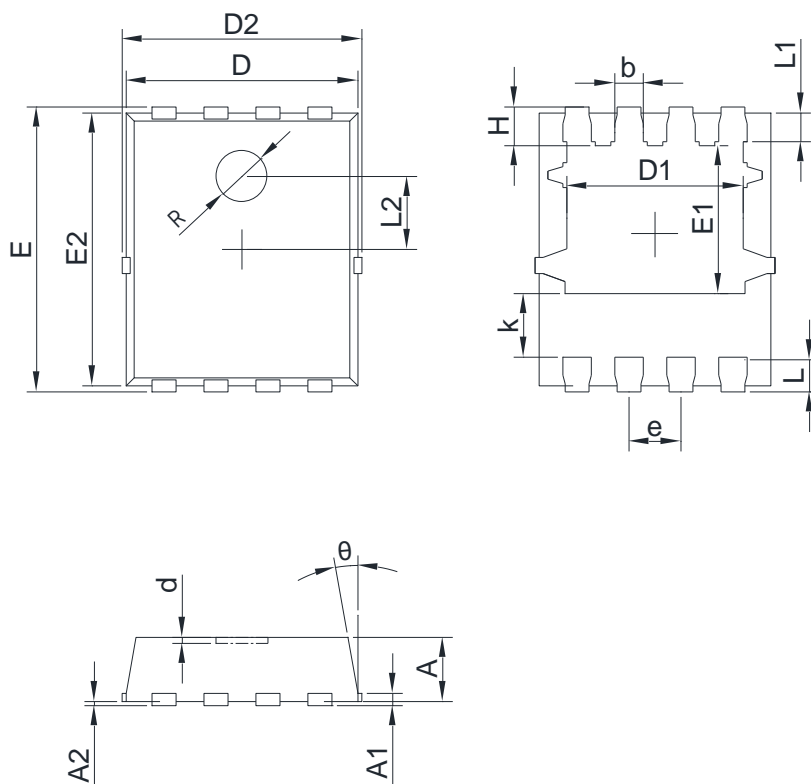


Figure 11: Normalized Maximum Transient Thermal Impedance

8. Dimension (PDFN5*6-8L)



Unit: mm

COMMON DIMENSIONS: UNITS OF MEASURE=MILLIMETER

SYMBOL	MILLIMETER			SYMBOL	MILLIMETER		
	MIN	Typ.	MAX		MIN	Typ.	MAX
A	0.900	1.000	1.100	e	1.270 TYP.		
A1	0.254 REF			l	0.534	0.610	0.686
A2	0~0.05			L1	0.424	0.500	0.576
D	4.824	4.900	4.976	L2	1.800 REF.		
D1	3.910	4.010	4.110	k	1.190	1.290	1.390
D2	4.924	5.000	5.076	H	0.549	0.625	0.701
E	5.924	6.000	6.076	θ	8°	10°	12°
E1	3.375	3.475	3.575	R	1.100	1.200	1.300
E2	5.674	5.750	5.826	d			0.100
b	0.350	0.400	0.450				

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