# N-Channel Enhancement Mode Power MOSFET

Description

This Power MOSFET is produced using advanced TRENCH technology.

This advanced technology has been especially tailored to minimize conduction loss, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode.

Features

- V_{DS}= 30V , I_D=90A

- $R_{DS\,(ON)\,TYP}$ = 3.6mΩ @ V_{GS} =10V

- $R_{DS\,(ON)\,TYP}$ = 5.3mΩ @V_{GS} =4.5V

- Very Low On-resistance $R_{DS(ON)}$

- Low Crss

- Fast switching

- 100% avalanche tested

- Improved dv/dt capability

PDFN3*3-8L
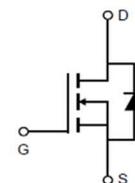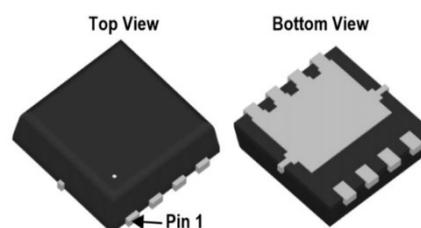
Schematic diagram

Applications

- Portable Equipment and Battery Powered systems

- Power Management in Notebook Computer

Absolute Maximum Ratings

Parameter		Symbol	Value	Unit
Drain-source Voltage		V_{DS}	30	V
Gate-source Voltage		V_{GS}	± 20	V
Continuous Drain Current	T_C=25°C	I_D	90	A
	T_C=100°C		48	
Maximum Power Dissipation(T_C=25°C)		P_D	31	W
Avalanche energy , single Pulse(L=0.5mH) [note2]		E_{AS}	39	mJ
Operating Junction And Storage Temperature		T_j, T_{stg}	-55 To 150	°C
Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds		T_L	300	°C

Thermal Resistance

| Parameter	Symbol	Max	Unit
Junction-to-Case	$R_{\theta JC}$	4	°C/W

Note:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. Pulse Test: Pulse Width $\leq$ 300μs, Duty Cycle $\leq$ 0.5%

Electrical Characteristic (TC=25℃ unless otherwise noted)

Parameter	Symbol	Value			Unit	Test Condition
		Min.	Typ.	Max.		
Off Characteristic						
Drain-source breakdown voltage	BV_{DSS}	30	-	-	V	$V_{GS}=0V$, $I_D= 250\mu A$
Zero gate voltage drain current	I_{DSS}	-	-	1	μA	$V_{DS}= 24V$, $V_{GS}=0V$
Gate-source leakage current	I_{GSS}	-	-	± 10	uA	$V_{GS}=\pm 20V$, $V_{DS}=0V$
On Characteristics						
Gate threshold voltage	$V_{GS(th)}$	1.1	1.6	2.1	V	$V_{DS}=V_{GS}$, $I_D= 250\mu A$
Drain-source on-state resistance	$R_{DS(on)}$	-	3.6	4.5	mΩ	$V_{GS}= 10V$, $I_D= 20A$
		-	5.3	7.2	mΩ	$V_{GS}= 4.5V$, $I_D= 18A$
Dynamic Characteristic						
Input Capacitance	C_{iss}	-	1859	-	PF	$V_{GS}=0V$, $V_{DS}= 15V$, f=1.0MHz
Output Capacitance	C_{oss}	-	260	-		
Reverse Transfer Capacitance	C_{rss}	-	212	-		
Switching Characteristics						
Turn-on delay time	$t_{d(on)}$	-	9.6	-	nS	$V_{DS}=15V$, $V_{GS}= 10V$, $R_G= 3.9\Omega$，$I_D= 15A$，$R_L=1\ \Omega$
Turn-on Rise time	t_r	-	23.4	-		
Turn-off delay time	$t_{d(off)}$	-	62.8			
Turn-off Fall time	t_f	-	23	-		
Gate Total Charge	Q_G	-	48	-	nC	$V_{GS}= 10V$, $V_{DS}= 25V$, $I_D= 14A$
Gate-Source Charge	Q_{gs}	-	3.4	-		
Gate-Drain Charge	Q_{gd}	-	14	-		
Drain-Source Diode Characteristics						
Body Diode Forward Voltage	V_{SD}	-	0.75	1.1	V	$V_{GS}=0V$, $I_{SD}= 1A$, $T_J = 25℃$
Body Diode Reverse Recovery Time	T_{rr}	-	18.2	-	ns	$TJ=25℃$，$I_F= 2A$, $V_{GS}=0V$, $d_i/d_t =100A/\mu s$
Body Diode Reverse Recovery Charge	Q_{rr}	-	9.2	-	nC	

■ TYPICAL CHARACTERISTICS
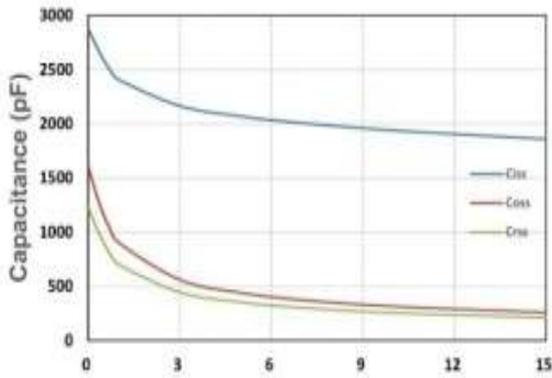
Figure 1. Capacitance
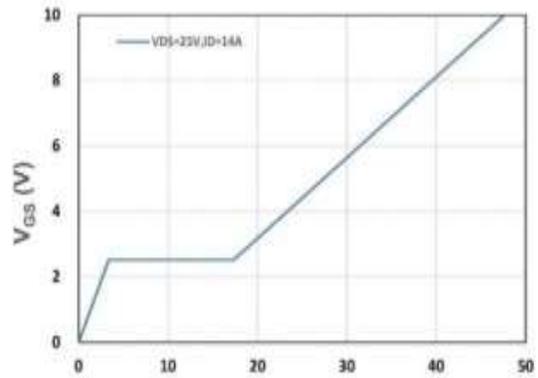
Figure 2. Gate Charge Characteristics
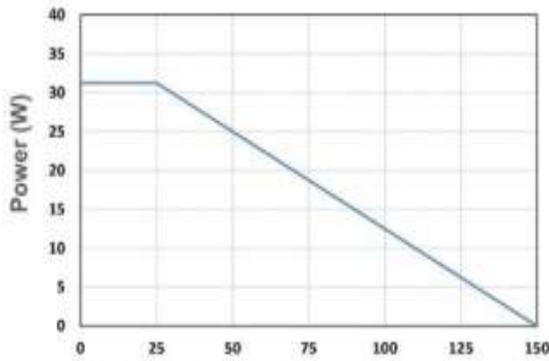
Figure 3. Power Dissipation
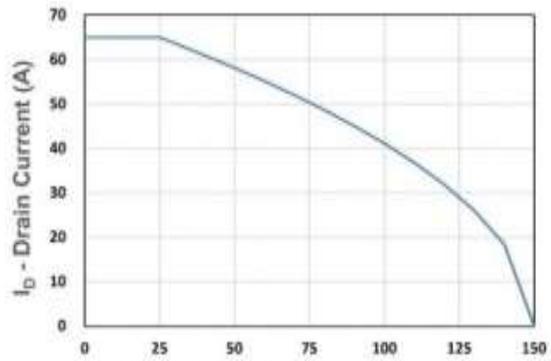
Figure 4. Drain Current
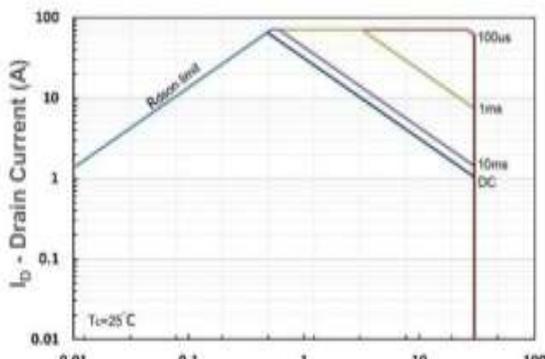
Figure 5. Safe Operating Area
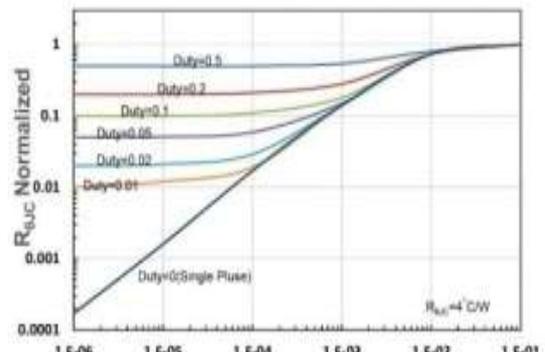
Figure 6. RθJC Transient Thermal Impedance

Package Information

PDFN3*3-8L
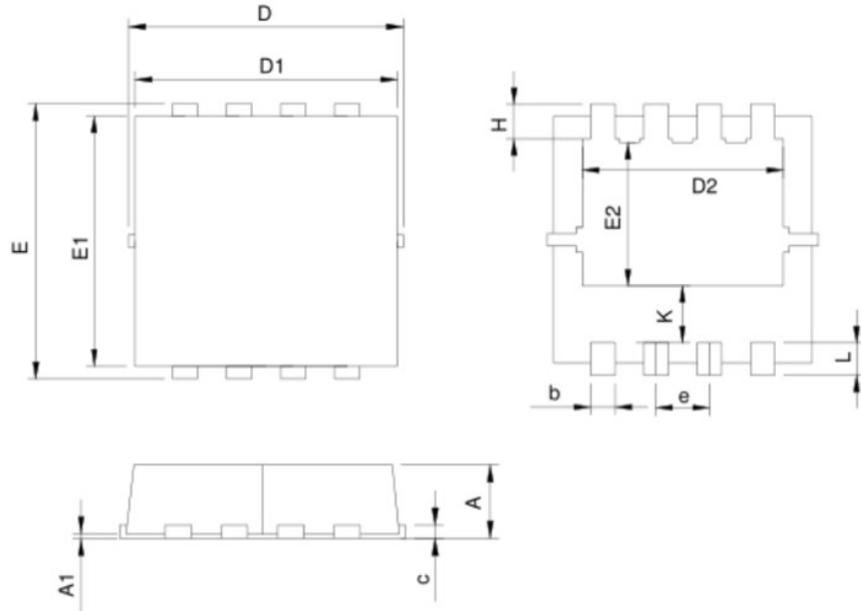
SYMBOL	DFN3.3x3.3-8			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	0.70	1.00	0.028	0.039
A1	0.00	0.05	0.000	0.002
b	0.25	0.35	0.010	0.014
c	0.14	0.20	0.006	0.008
D	3.10	3.50	0.122	0.138
D1	3.05	3.25	0.120	0.128
D2	2.35	2.55	0.093	0.100
E	3.10	3.50	0.122	0.138
E1	2.90	3.10	0.114	0.122
E2	1.64	1.84	0.065	0.072
e	0.65 BSC		0.026 BSC	
H	0.32	0.52	0.013	0.020
K	0.59	0.79	0.023	0.031
L	0.25	0.55	0.010	0.022

RECOMMENDED LAND PATTERN

UNIT: mm