N-Channel Enhancement Mode MOSFET

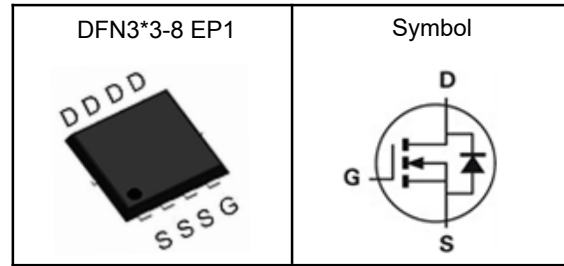## Features

● Advanced Trench technology

● High Speed Power Switching

● Reliable and Rugged

● ROHS Compliant

●100% Avalanche Tested

Applications

● Power Management in Desktop Computer

● DC/DC Converters

Pin Description

DFN3*3-8 EP1	Symbol

V_{DSS}	40	V
$R_{DS(ON)-Typ}$	5.2	mΩ
I_D	65	A

Absolute Maximum Ratings(T$_C$=25℃, Unless Otherwise Noted)

Symbol	Parameter	Rating	Unit
V_{DSS}	Drain-Source Voltage	40	V
V_{GSS}	Gate-Source Voltage	±20	V
T_J	Maximum Junction Temperature	-55 to 150	℃
T_{STG}	Storage Temperature Range	-55 to 150	℃
I_{DM}[①]	Pulse Drain Current Tested	91	A
I_D	Continuous Drain Current	65	A
P_D	Maximum Power Dissipation	42	W
E_{AS}	Avalanche Energy, Single pulse	42	mJ

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{θJA}$	Thermal Resistance-Junction to Ambient	80	℃/W
$R_{θJC}$	Thermal Resistance-Junction to Case	3.0	℃/W

Note ① : Max. current is limited by bonding wire.

Note ② : UIS tested and pulse width are limited by maximum junction temperature 150℃.

Note ③ : Surface Mounted on 1in^2 FR-4 board with 1oz.

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Electrical Characteristics (T$_J$=25℃, Unless Otherwise Noted)

| Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Static Electrical Characteristics						
BV$_{DSS}$	Drain-Source Breakdown Voltage	V$_{GS}$=0V, I$_D$=250uA	40	---	---	V
I$_{DSS}$	Zero Gate Voltage Drain Current	V$_{DS}$=32V, V$_{GS}$=0V	---	---	1	uA
V$_{GS(th)}$	Gate Threshold Voltage	V$_{DS}$=V$_{GS}$, I$_D$=250uA	1.0	---	2.2	V
I$_{GSS}$	Gate Leakage Current	V$_{GS}$=±20V, V$_{DS}$=0V	---	---	±100	nA
R$_{DS(ON)}$	Drain-Source On-state Resistance	V$_{GS}$=10V, I$_D$=20A	---	5.2	6.2	mΩ
		V$_{GS}$=4.5V, I$_D$=10A	---	7	9	mΩ
Dynamic Characteristics[5]						
C$_{iss}$	Input Capacitance	V$_{GS}$=0V, V$_{DS}$=20V, Freq.=1MHz	---	2470	---	pF
C$_{oss}$	Output Capacitance		---	178	---	
C$_{rss}$	Reverse Transfer Capacitance		---	150	---	
T$_{d(on)}$	Turn-on Delay Time	V$_{DS}$=20V , V$_{GS}$=10V , R$_G$=6Ω, I$_D$=1A	---	10	---	nS
T$_r$	Turn-on Rise Time		---	18	---	
T$_{d(off)}$	Turn-off Delay Time		---	45	---	
T$_f$	Turn-off Fall Time		---	32	---	
Q$_g$	Total Gate Charge	V$_{DS}$=32V , V$_{GS}$=10V , I$_D$=40A	---	63	---	nC
Q$_{gs}$	Gate-Source Charge		---	12	---	
Q$_{gd}$	Gate-Drain Charge		---	13	---	
Source-Drain Characteristics						
V$_{SD}$	Diode Forward Voltage	I$_S$=10A, V$_{GS}$=0V	---	0.8	1.1	V
t$_{rr}$	Reverse Recovery Time	I$_F$=20A ,V$_R$=32V di/dt=100A/μs，T$_J$=25℃	---	15	---	nS
Q$_{rr}$	Reverse Recovery Charge		---	9	---	nC

Note ④： Pulse test (pulse width≤300us, duty cycle≤2%).

Note ⑤ : Guaranteed by design, not subject to production testing.

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Typical Characteristics
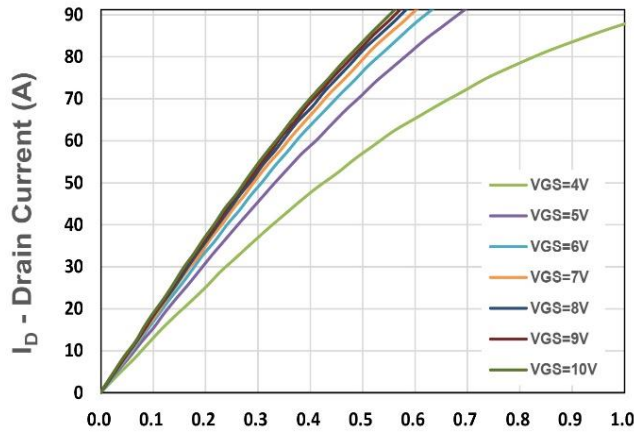
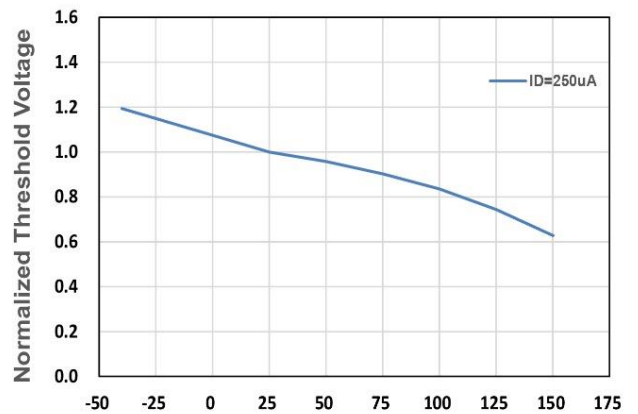Figure 1. Output Characteristics
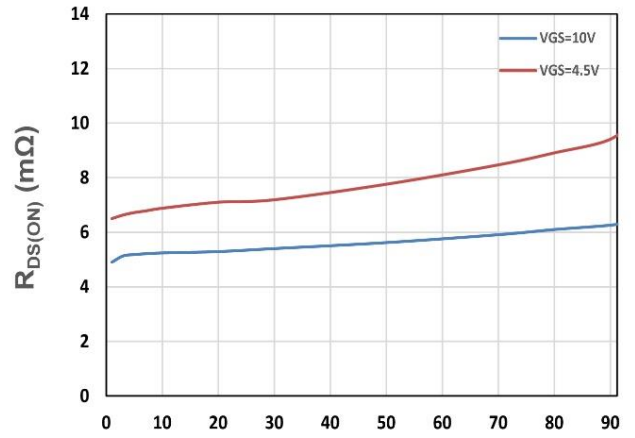
Figure 2. On-Resistance vs. ID
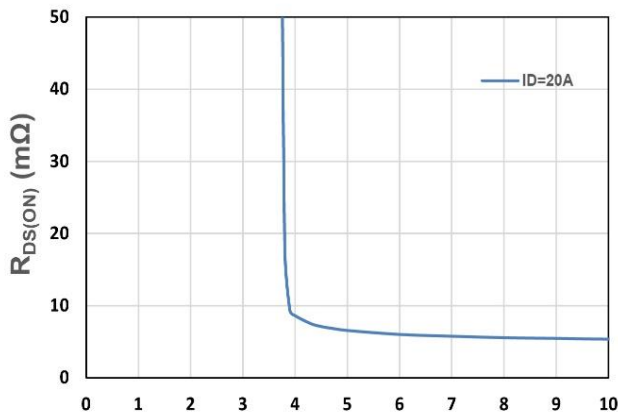
Figure 3. On-Resistance vs. VGS

Figure 4. Gate Threshold Voltage
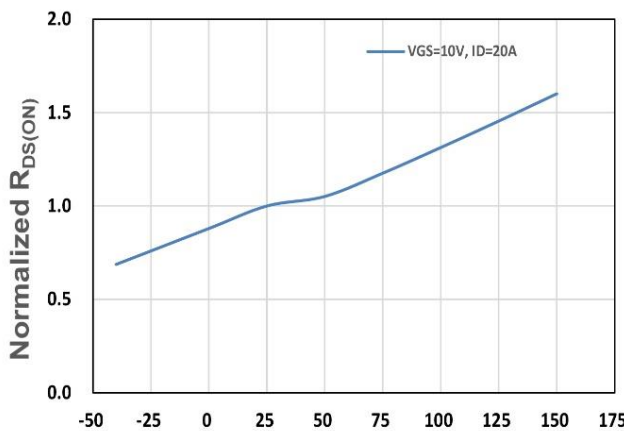
Figure 5. Drain-Source On Resistance
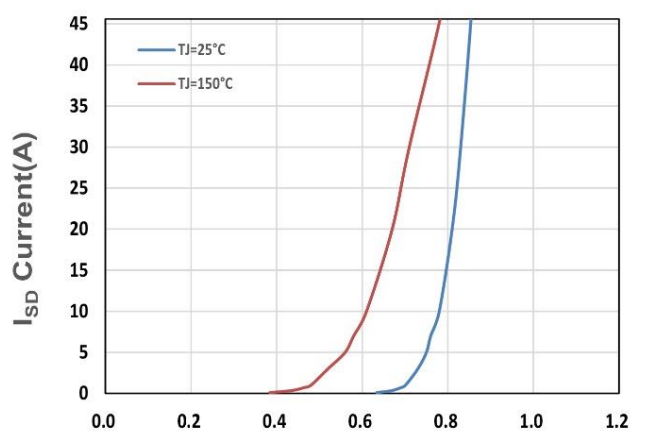
Figure 6. Source-Drain Diode Forward

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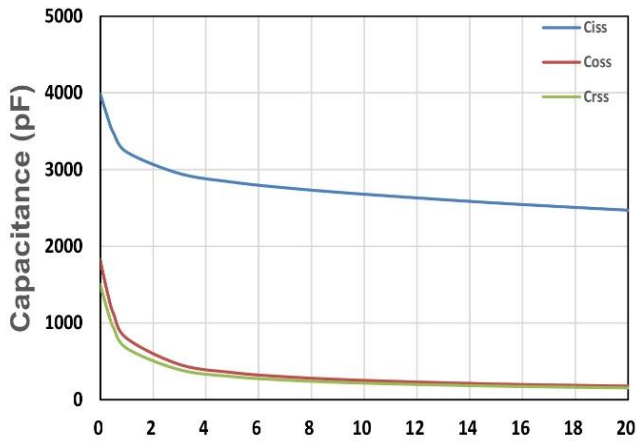
Figure 7. Capacitance
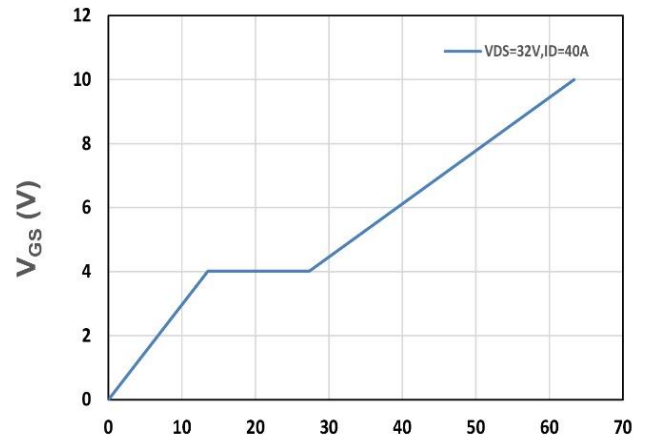
Figure 8. Gate Charge Characteristics
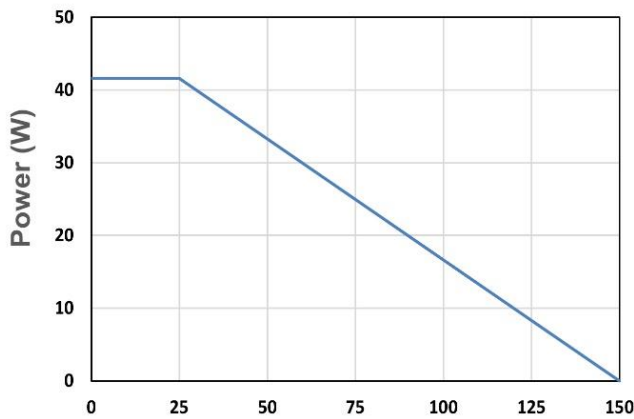
Figure 9. Power Dissipation
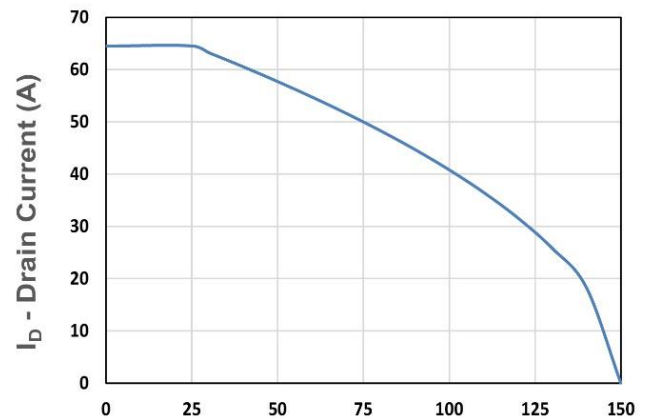
Figure 10. Drain Current
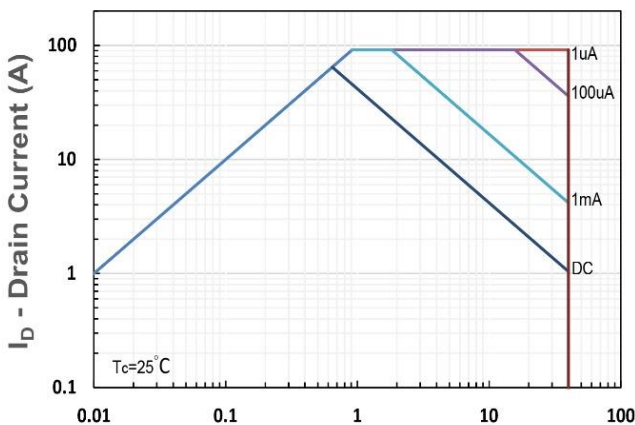
Figure 11. Safe Operating Area
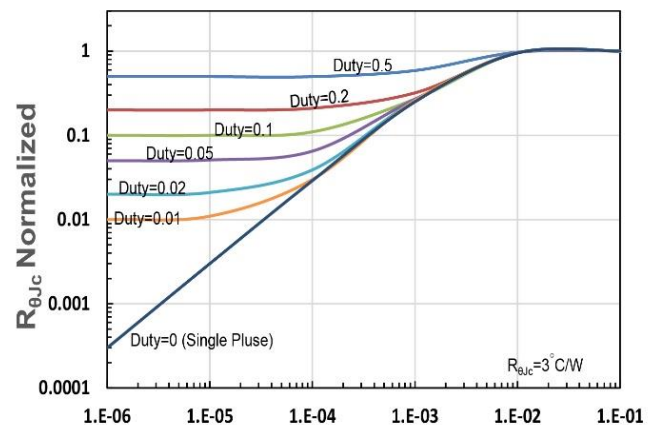
Figure 12. $R_{\theta JC}$ Transient Thermal Impedance

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DFN3*3-8 EP1 Package Outline Data
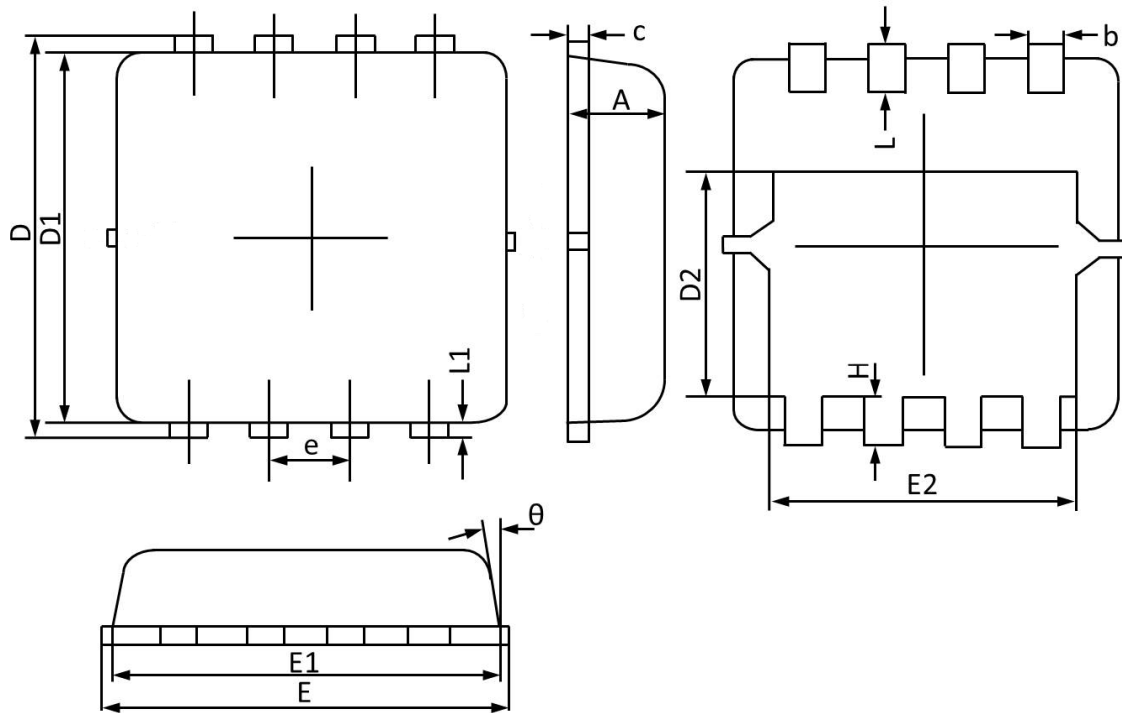
Symbol	Dimensions (unit:mm)			Symbol	Dimensions (unit:mm)		
	Min	**Typ**	**Max**		**Min**	**Typ**	**Max**
A	0.70	0.75	0.85	**E1**	2.90	3.10	3.25
b	0.24	0.30	0.35	**E2**	2.35	2.50	2.60
c	0.10	0.17	0.25	**e**	0.65 BSC		
D	3.10	3.30	3.45	**H**	0.30	0.40	0.50
D1	2.90	3.05	3.20	**L**	0.30	0.40	0.50
D2	1.45	1.70	1.95	**L1**	--	0.13	--
E	3.05	3.25	3.40	**θ**	0°		14°