

**Dual N-Channel Enhancement Mode Field Effect Transistor****PRODUCT SUMMARY**

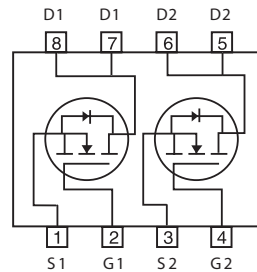
V _{DSS}	I _D	R _{DS(ON)} (mΩ) Max
30V	4.5A	42 @ V _{GS} =10V
		74 @ V _{GS} =4.5V

FEATURES

- Super high dense cell design for low R_{DS(ON)}.
- Rugged and reliable.
- Surface Mount Package.

DFN 3x3

PIN1

**ABSOLUTE MAXIMUM RATINGS** (T_A=25°C unless otherwise noted)

Symbol	Parameter	Limit	Units
V _{DS}	Drain-Source Voltage	30	V
V _{GS}	Gate-Source Voltage	±20	V
I _D	Drain Current-Continuous ^a	T _A =25°C	4.5
		T _A =70°C	3.6
I _{DM}	-Pulsed ^b	30	A
E _{AS}	Single Pulse Avalanche Energy ^d	16	mJ
P _D	Maximum Power Dissipation ^a	T _A =25°C	1.47
		T _A =70°C	0.94
T _J , T _{STG}	Operating Junction and Storage Temperature Range	-55 to 150	°C

THERMAL CHARACTERISTICS

R _{θJA}	Thermal Resistance, Junction-to-Ambient	85	°C/W
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SP3900

Ver 1.1

ELECTRICAL CHARACTERISTICS (T_A=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V , I _D =250uA	30			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =24V , V _{GS} =0V			1	uA
I _{GSS}	Gate-Body Leakage Current	V _{GS} = ±20V , V _{DS} =0V			±100	nA
ON CHARACTERISTICS						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	1	2.1	3	V
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =10V , I _D =2.25A		34	42	m ohm
		V _{GS} =4.5V , I _D =1.7A		55	74	m ohm
g _{FS}	Forward Transconductance	V _{DS} =10V , I _D =2.25A		9		S
DYNAMIC CHARACTERISTICS ^c						
C _{iss}	Input Capacitance	V _{DS} =10V,V _{GS} =0V f=1.0MHz		380		pF
C _{oss}	Output Capacitance			63		pF
C _{RSS}	Reverse Transfer Capacitance			46		pF
SWITCHING CHARACTERISTICS ^c						
t _{D(ON)}	Turn-On Delay Time	V _{DD} =15V I _D =1A V _{GS} =10V R _{GEN} = 6 ohm		11		ns
t _r	Rise Time			11		ns
t _{D(OFF)}	Turn-Off Delay Time			17		ns
t _f	Fall Time			4.6		ns
Q _g	Total Gate Charge	V _{DS} =15V,I _D =2.25A,V _{GS} =10V		6		nC
		V _{DS} =15V,I _D =2.25,V _{GS} =4.5V		3.2		nC
Q _{gs}	Gate-Source Charge	V _{DS} =15V,I _D =2.25A, V _{GS} =10V		1.2		nC
Q _{gd}	Gate-Drain Charge			1.7		nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
V _{SD}	Diode Forward Voltage	V _{GS} =0V,I _S =1A		0.8	1.2	V

Notes

- Surface Mounted on FR4 Board, t ≤ 10sec.
- Pulse Test: Pulse Width ≤ 300us, Duty Cycle ≤ 2%.
- Guaranteed by design, not subject to production testing.
- Starting T_J=25°C, L=0.5mH, V_{DD} = 20V. (See Figure13)

Jan,23,2014

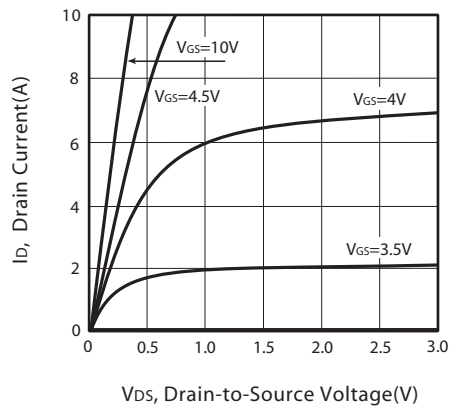


Figure 1. Output Characteristics

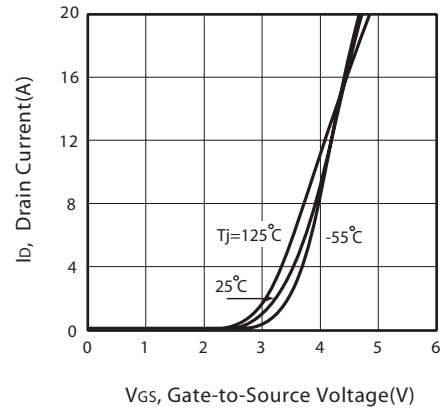


Figure 2. Transfer Characteristics

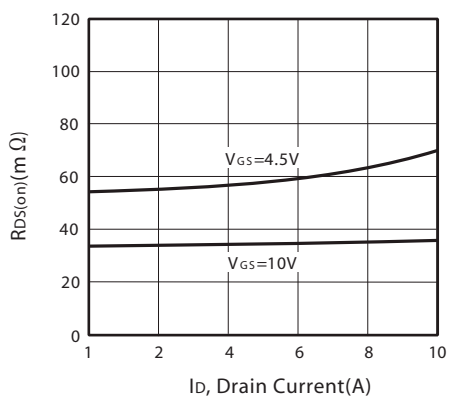


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

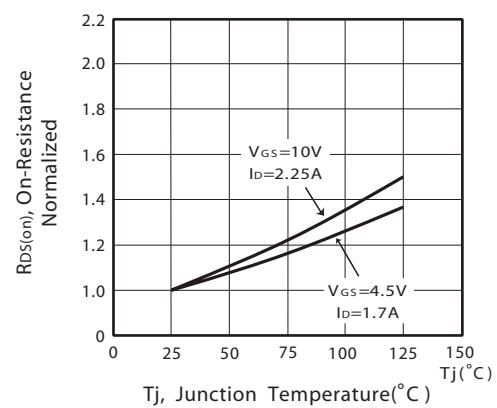


Figure 4. On-Resistance Variation with Drain Current and Temperature

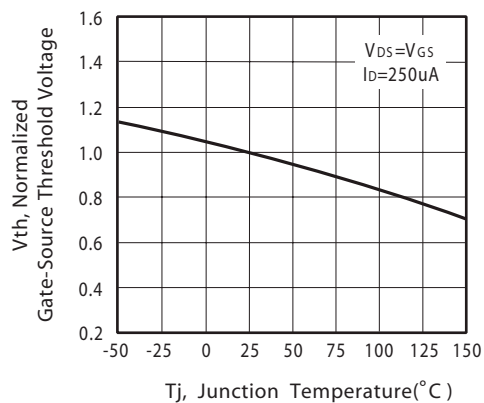


Figure 5. Gate Threshold Variation with Temperature

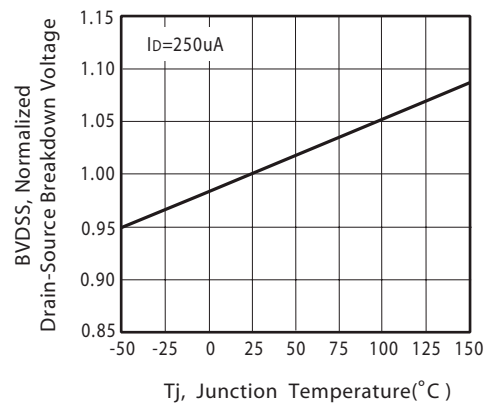


Figure 6. Breakdown Voltage Variation with Temperature

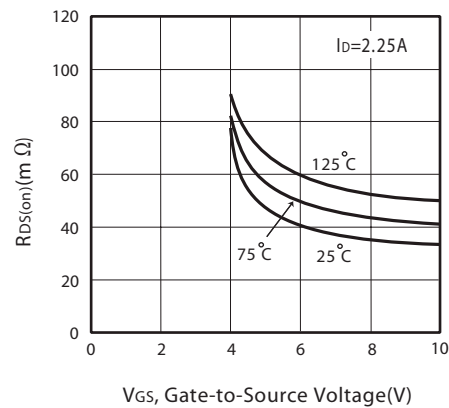


Figure 7. On-Resistance vs. Gate-Source Voltage

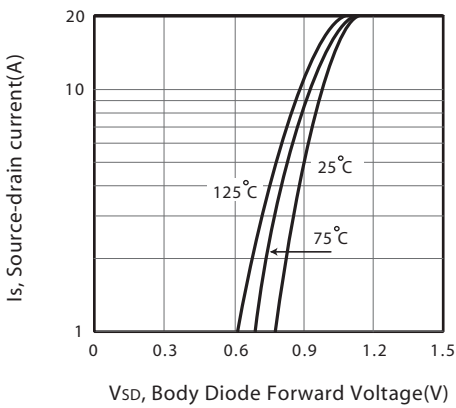


Figure 8. Body Diode Forward Voltage Variation with Source Current

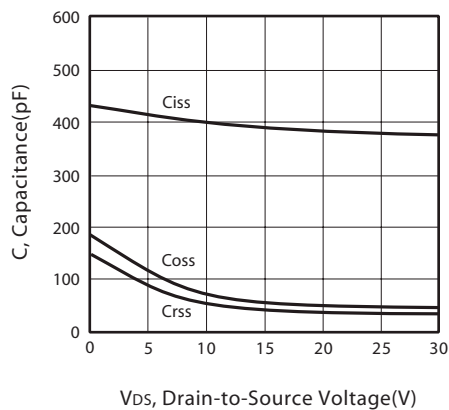


Figure 9. Capacitance

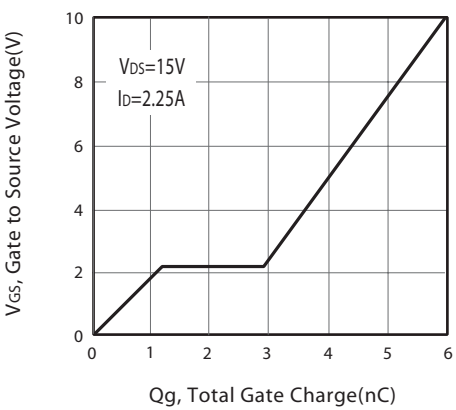


Figure 10. Gate Charge

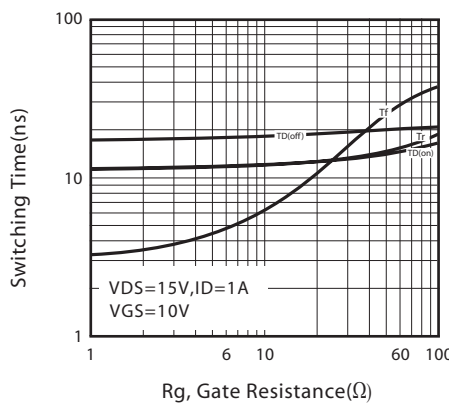


Figure 11. switching characteristics

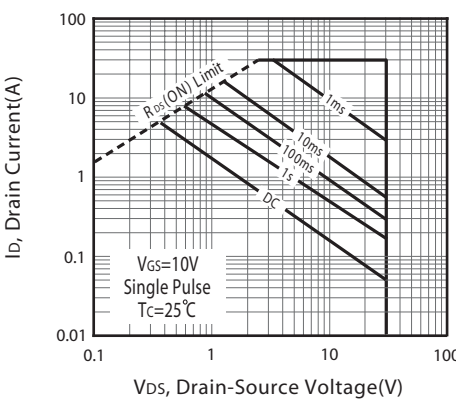
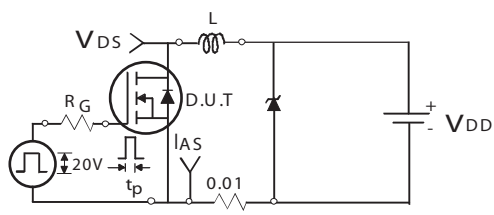
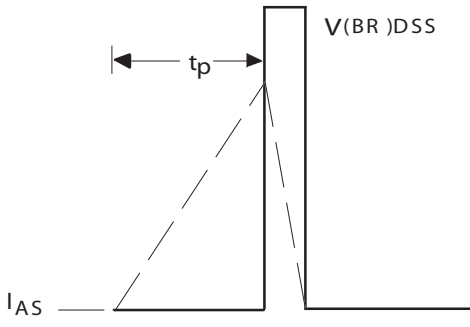


Figure 12. Maximum Safe Operating Area



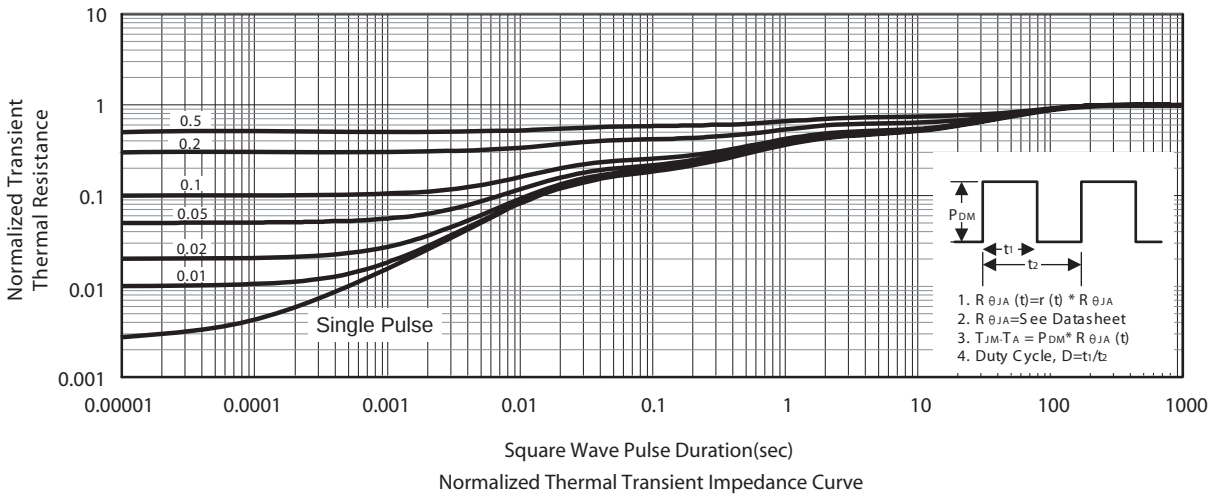
Unclamped Inductive Test Circuit

Figure 13a.



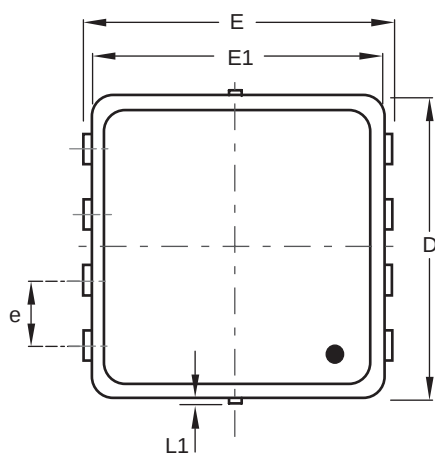
Unclamped Inductive Waveforms

Figure 13b.

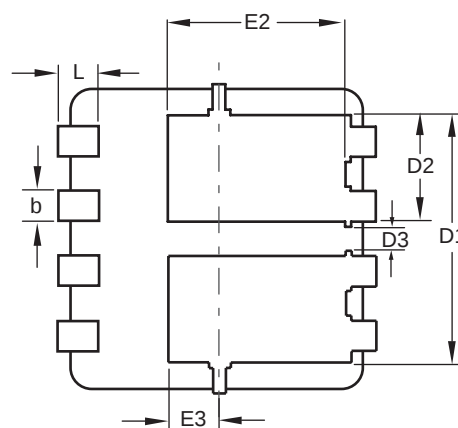


PACKAGE OUTLINE DIMENSIONS

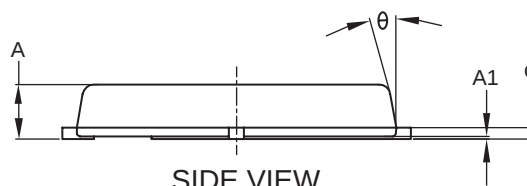
DFN 3x3-8L



TOP VIEW



BOTTOM VIEW



SIDE VIEW

SYMBOLS	MILLIMETERS		
	MIN	NOM	MAX
A	0.70	0.80	0.90
A1	0.00	—	0.05
b	0.24	0.30	0.35
c	0.10	0.152	0.25
D	3.00 BSC		
D1	2.475 BSC		
D2	1.063 BSC		
D3	0.225 BSC		
E	3.20 BSC		
E1	3.00 BSC		
E2	1.813 BSC		
E3	0.525 BSC		
e	0.65 BSC		
L	0.30	0.40	0.50
L1	0.00	—	0.100
θ	0°	10°	12°

TOP MARKING DEFINITION

