



N-Channel Logic Level Enhancement Mode Field Effect Transistor

PRODUCT SUMMARY		
V _{DSS}	I _D	R _{DS(ON)} (mΩ) Max
60V	10A	16 @ V _{GS} =10V
		24 @ V _{GS} =4.5V

FEATURES

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



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

Symbol	Parameter	Limit	Units
V _{DS}	Drain-Source Voltage	60	V
V _{GS}	Gate-Source Voltage	±20	V
I _D	Drain Current-Continuous ^{a d}	T _C =25°C	42
		T _C =100°C	26
		T _A =25°C	10
		T _A =70°C	8
I _{DM}	-Pulsed ^d	35	A
E _{AS}	Single Pulse Avalanche Energy ^c	156	mJ
P _D	Maximum Power Dissipation ^a	T _C =25°C	54
		T _A =25°C	3.1
		T _A =70°C	2
T _J , T _{STG}	Operating Junction and Storage Temperature Range	-55 to 150	°C

THERMAL CHARACTERISTICS

R _{θJA}	Thermal Resistance, Junction-to-Ambient	40	°C/W
R _{θJC}	Thermal Resistance, Junction-to-Case	2.3	°C/W

SP632S

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	60			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =48V , 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	1.5	3	V
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =10V , I _D =5A		13	16	m ohm
		V _{GS} =4.5V , I _D =4A		18	24	m ohm
g _{FS}	Forward Transconductance	V _{DS} =10V , I _D =5A		15		S
DYNAMIC CHARACTERISTICS^b						
C _{ISS}	Input Capacitance	V _{DS} =25V, V _{GS} =0V f=1.0MHz		2280		pF
C _{OSS}	Output Capacitance			144		pF
C _{RSS}	Reverse Transfer Capacitance			117		pF
SWITCHING CHARACTERISTICS^b						
t _{D(ON)}	Turn-On Delay Time	V _{DD} =30V I _D =1A V _{GS} =10V R _{GEN} = 6 ohm		37		ns
t _r	Rise Time			27		ns
t _{D(OFF)}	Turn-Off Delay Time			99		ns
t _f	Fall Time			20		ns
Q _g	Total Gate Charge	V _{DS} =30V, I _D =5A, V _{GS} =10V		32		nC
		V _{DS} =30V, I _D =5A, V _{GS} =4.5V		15.6		nC
Q _{gs}	Gate-Source Charge	V _{DS} =30V, I _D =5A, V _{GS} =10V		3		nC
Q _{gd}	Gate-Drain Charge			7.6		nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =1A		0.75	1.2	V

Notes

- Surface Mounted on FR4 Board of 1 inch² , 1oz.
- Guaranteed by design, not subject to production testing.
- Starting T_J=25°C, L=0.5mH, V_{DD} = 30V.(See Figure13)
- Drain current limited by maximum junction temperature.

Jan,24,2014

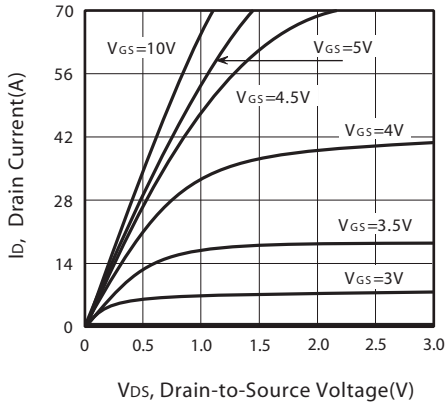


Figure 1. Output Characteristics

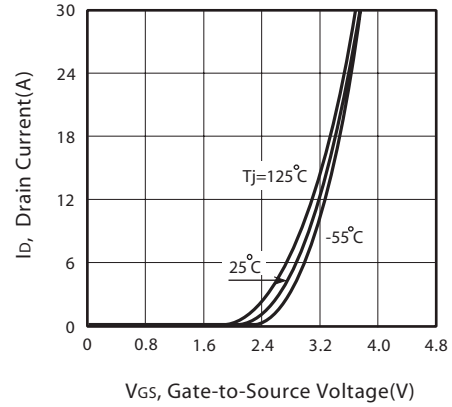


Figure 2. Transfer Characteristics

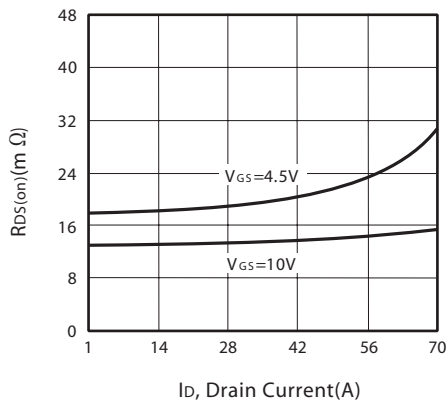


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

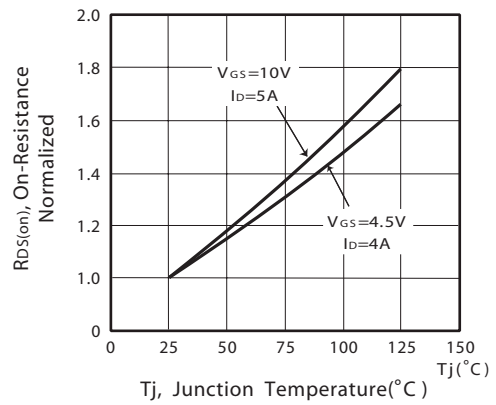


Figure 4. On-Resistance Variation with Drain Current and Temperature

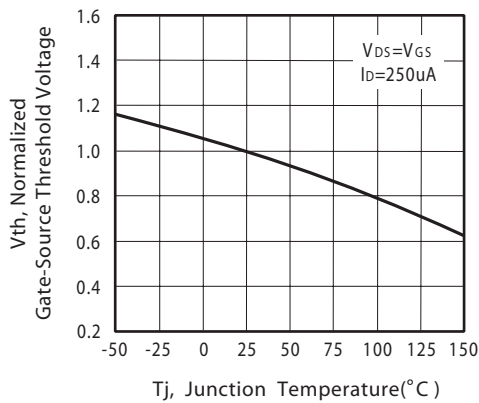


Figure 5. Gate Threshold Variation with Temperature

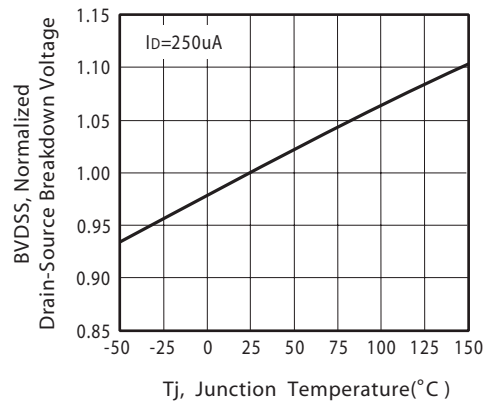


Figure 6. Breakdown Voltage Variation with Temperature

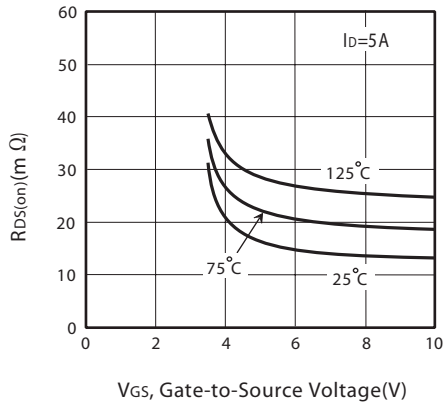


Figure 7. On-Resistance vs. Gate-Source Voltage

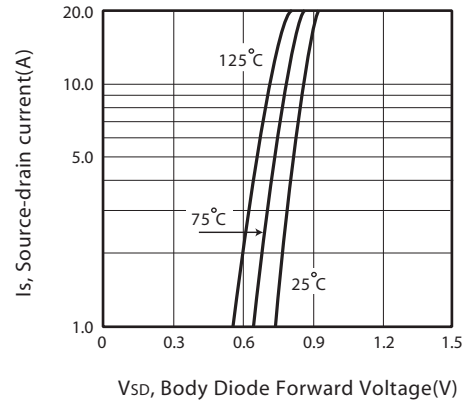


Figure 8. Body Diode Forward Voltage Variation with Source Current

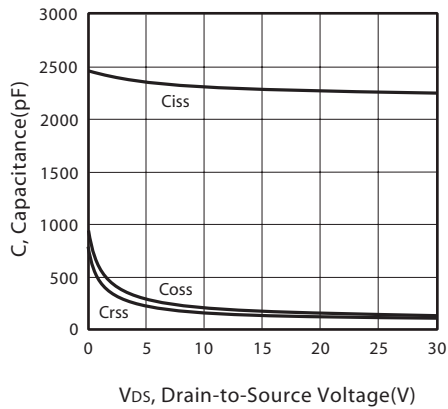


Figure 9. Capacitance

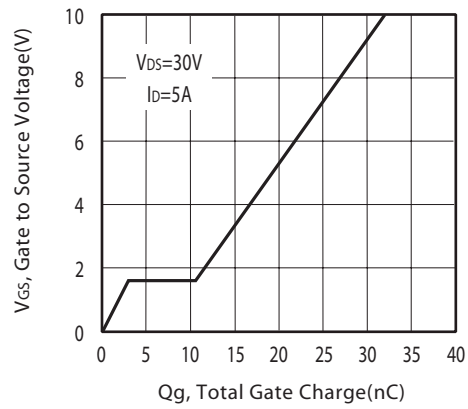


Figure 10. Gate Charge

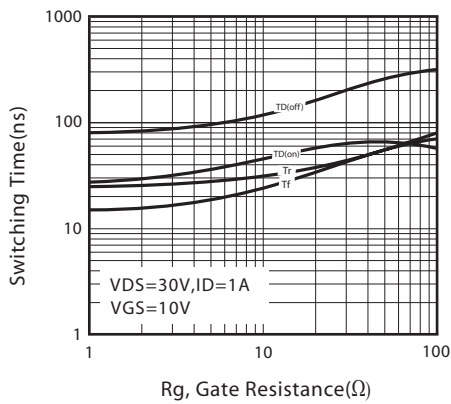


Figure 11. switching characteristics

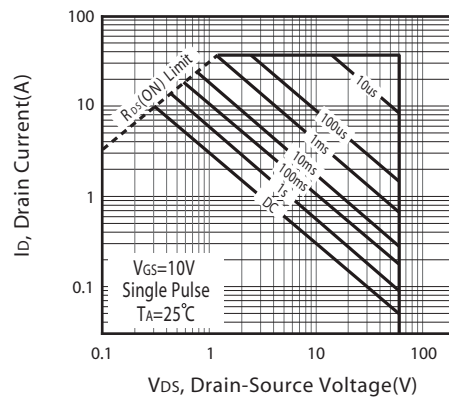
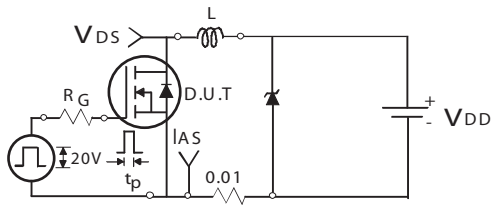
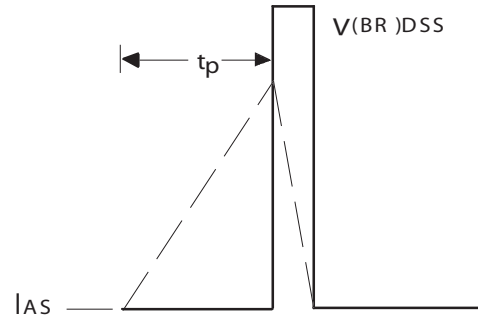


Figure 12. Maximum Safe Operating Area



Unclamped Inductive Test Circuit

Figure 13a.



Unclamped Inductive Waveforms

Figure 13b.

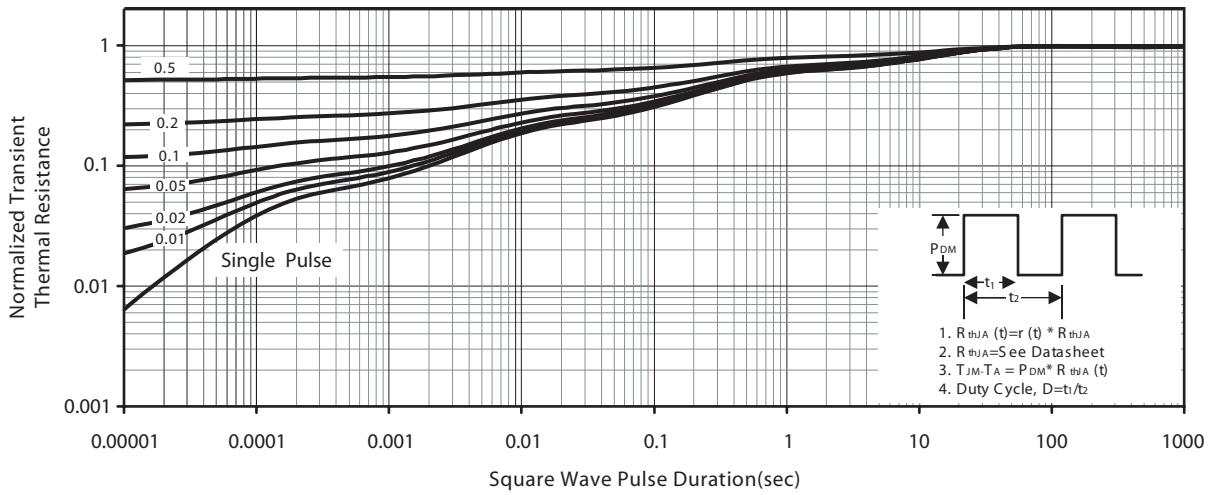
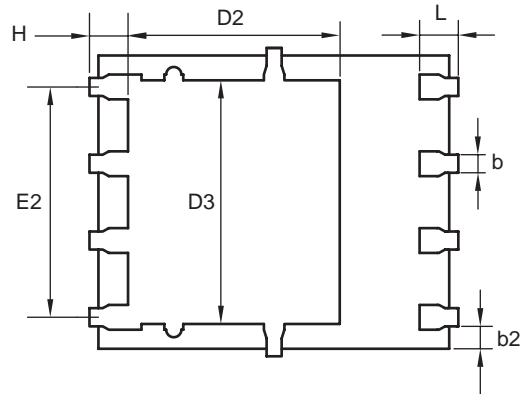
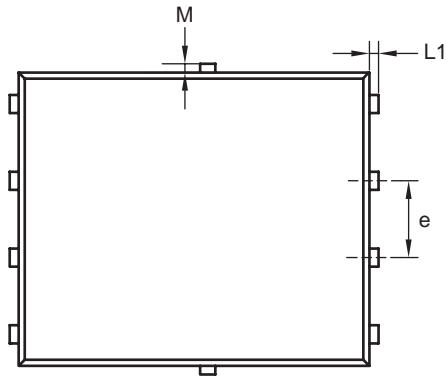


Figure 13. Normalized Thermal Transient Impedance Curve

PACKAGE OUTLINE DIMENSIONS

DFN 5x6



SYMBOLS	MILLIMETERS		
	MIN.	NOM.	MAX.
A	0.90	1.00	1.10
b	0.20	0.30	0.40
b2	0.25	0.35	0.45
C	0.15	0.25	0.35
D	5.90	6.10	6.30
D1	5.60	5.80	6.00
D2	3.50 REF.		
D3	4.00 REF.		
E	5.00	5.20	5.40
E1	4.70	4.90	5.10
E2	3.61	3.81	4.01
e	1.17	1.27	1.37
H	0.63 REF.		
L	0.53	0.63	0.73
L1	0.05	0.15	0.25
M	0.05	0.15	0.25
θ	8°	10°	12°

