

### Features

- Low  $R_{DS(ON)}$
- Green Device Available
- 100% EAS Tested
- Advanced Trench MOS Technology

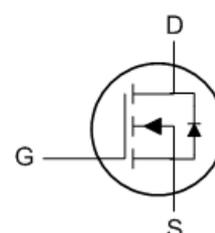
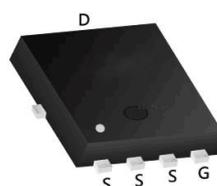
### Applications

- Power Management in TV Converter.
- DC/DC Converter.

### Product Summary

BVDSS	RDSON	ID
150V	56mΩ	23A

### DFN 5X6 Pin Configuration



### Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	150	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D@T_C=25^\circ C$	Continuous Drain Current <sup>1</sup>	23	A
$I_D@T_C=100^\circ C$	Continuous Drain Current <sup>1</sup>	16	A
$I_D@T_A=25^\circ C$	Continuous Drain Current <sup>1</sup>	4.5	A
$I_D@T_A=70^\circ C$	Continuous Drain Current <sup>1</sup>	3.8	A
$I_{DM}$	Pulsed Drain Current <sup>2</sup>	60	A
$P_D@T_C=25^\circ C$	Total Power Dissipation <sup>3</sup>	75	W
$P_D@T_A=25^\circ C$	Total Power Dissipation <sup>3</sup>	2.7	W
$T_{STG}$	Storage Temperature Range	-55 to 175	$^\circ C$
$T_J$	Operating Junction Temperature Range	-55 to 175	$^\circ C$

### Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient <sup>1</sup>	---	55	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case <sup>1</sup>	---	2.0	$^\circ C/W$

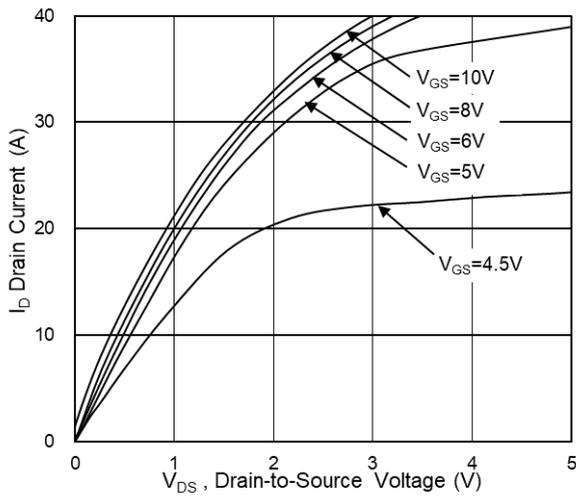
## Electrical Characteristics (T<sub>J</sub>=25 °C, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V , I <sub>D</sub> =250uA	150	---	---	V
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance <sup>2</sup>	V <sub>GS</sub> =10V , I <sub>D</sub> =10A	---	47	56	mΩ
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250uA	2	---	4	V
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =120V , V <sub>GS</sub> =0V , T <sub>J</sub> =25°C	---	---	1	uA
		V <sub>DS</sub> =120V , V <sub>GS</sub> =0V , T <sub>J</sub> =55°C	---	---	5	
I <sub>GSS</sub>	Gate-Source Leakage Current	V <sub>GS</sub> =±20V , V <sub>DS</sub> =0V	---	---	±100	nA
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =5V , I <sub>D</sub> =10A	---	25	---	S
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =75V , V <sub>GS</sub> =10V , I <sub>D</sub> =10A	---	23	---	nC
Q <sub>gs</sub>	Gate-Source Charge		---	5.8	---	
Q <sub>gd</sub>	Gate-Drain Charge		---	4.2	---	
T <sub>d(on)</sub>	Turn-On Delay Time	V <sub>DD</sub> =75V , V <sub>GS</sub> =10V , R <sub>G</sub> =3.3Ω I <sub>D</sub> =10A	---	16.2	---	ns
T <sub>r</sub>	Rise Time		---	18.6	---	
T <sub>d(off)</sub>	Turn-Off Delay Time		---	28.5	---	
T <sub>f</sub>	Fall Time		---	6.5	---	
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =75V , V <sub>GS</sub> =0V , f=1MHz	---	1190	---	pF
C <sub>oss</sub>	Output Capacitance		---	73	---	
C <sub>rss</sub>	Reverse Transfer Capacitance		---	4	---	
<b>Diode Characteristics</b>						
I <sub>S</sub>	Continuous Source Current <sup>1,4</sup>	V <sub>G</sub> =V <sub>D</sub> =0V , Force Current	---	---	20	A
V <sub>SD</sub>	Diode Forward Voltage <sup>2</sup>	V <sub>GS</sub> =0V , I <sub>S</sub> =1A , T <sub>J</sub> =25°C	---	---	1.2	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>F</sub> =10A , dI/dt=100A/μs ,	---	45	---	nS
Q <sub>rr</sub>	Reverse Recovery Charge	T <sub>J</sub> =25°C	---	138	---	nC

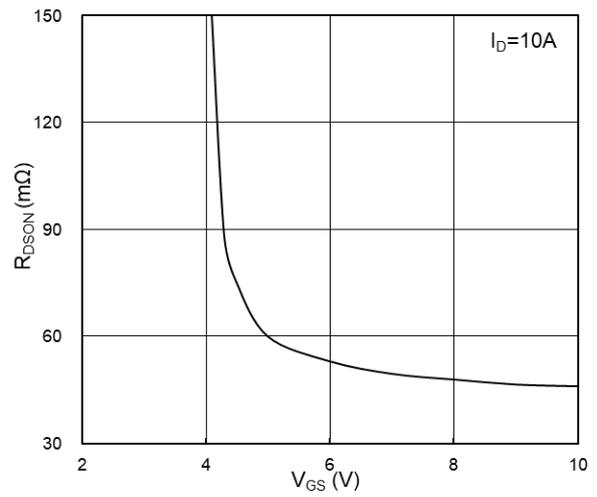
Note :

- 1.The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper.
- 2.The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%
- 3.The power dissipation is limited by 150°C junction temperature
- 4.The data is theoretically the same as I<sub>D</sub> and I<sub>S</sub> , in real applications , should be limited by total power dissipation.

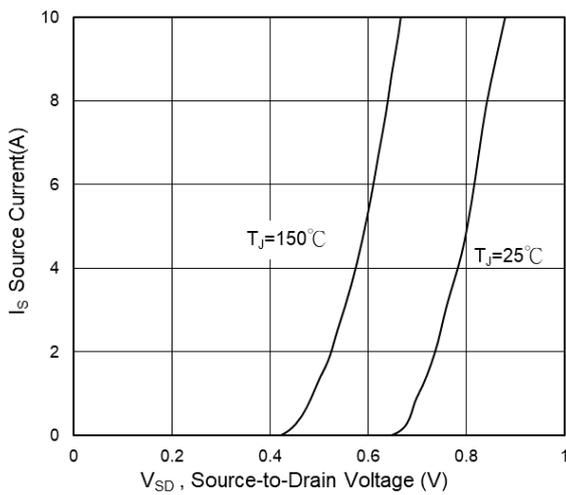
## Typical Characteristics



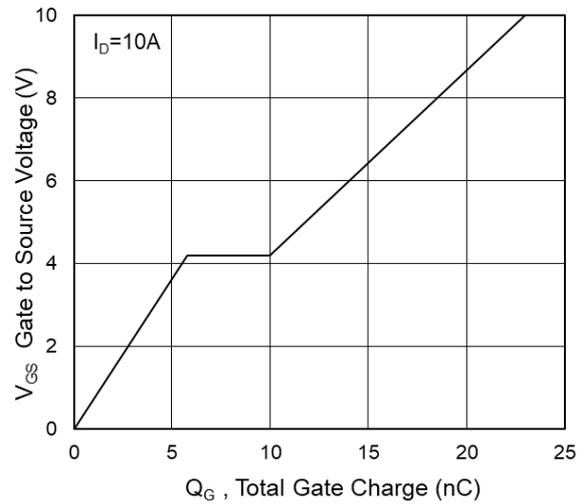
**Fig.1 Typical Output Characteristics**



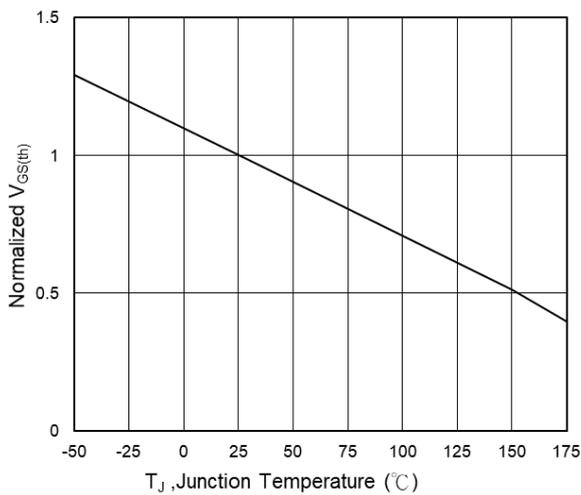
**Fig.2 On-Resistance vs G-S Voltage**



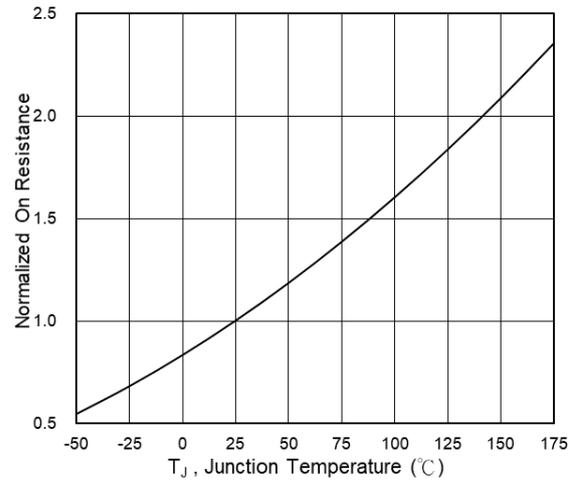
**Fig.3 Source Drain Forward Characteristics**



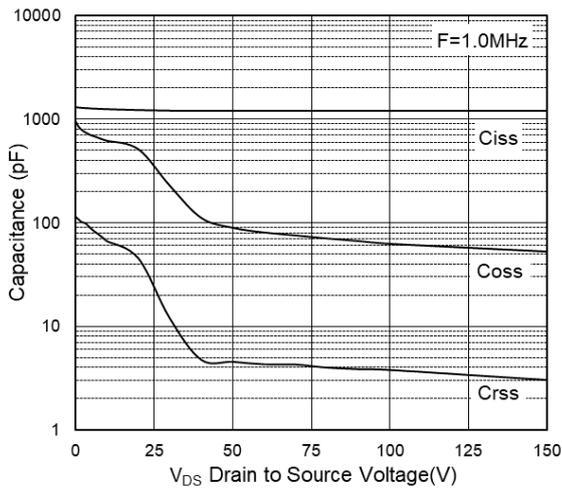
**Fig.4 Gate-Charge Characteristics**



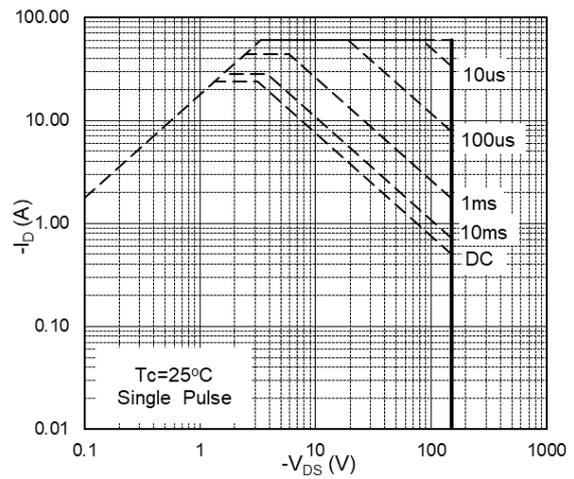
**Fig.5 Normalized  $V_{GS(th)}$  vs  $T_J$**



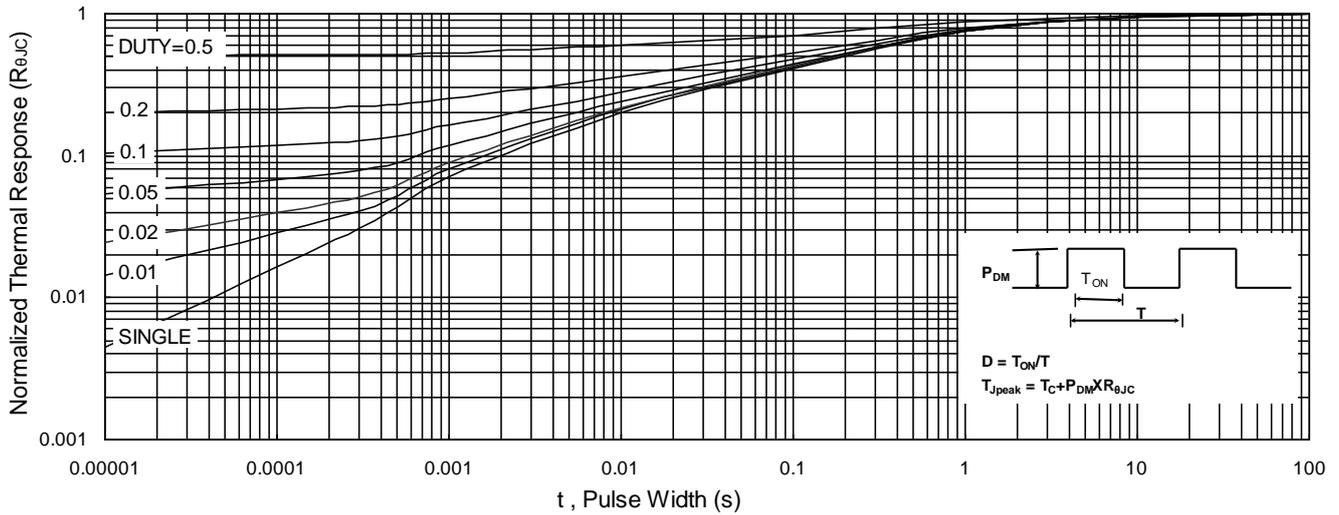
**Fig.6 Normalized  $R_{DS(on)}$  vs  $T_J$**



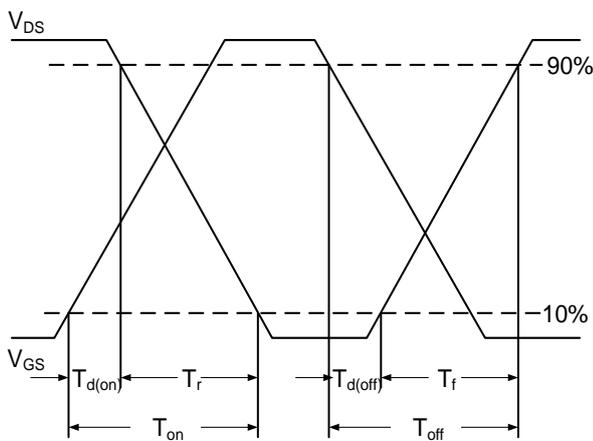
**Fig.7 Capacitance**



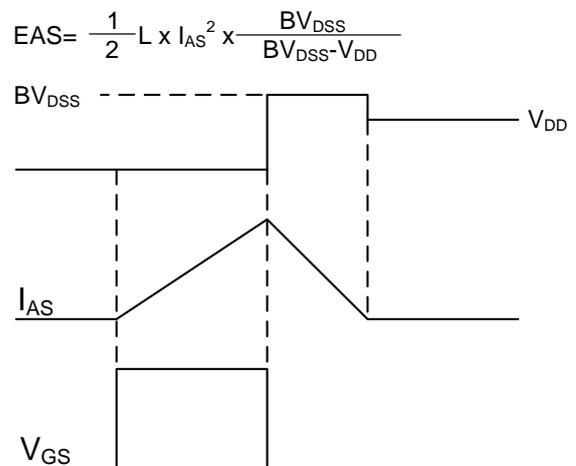
**Fig.8 Safe Operating Area**



**Fig.9 Normalized Maximum Transient Thermal Impedance**

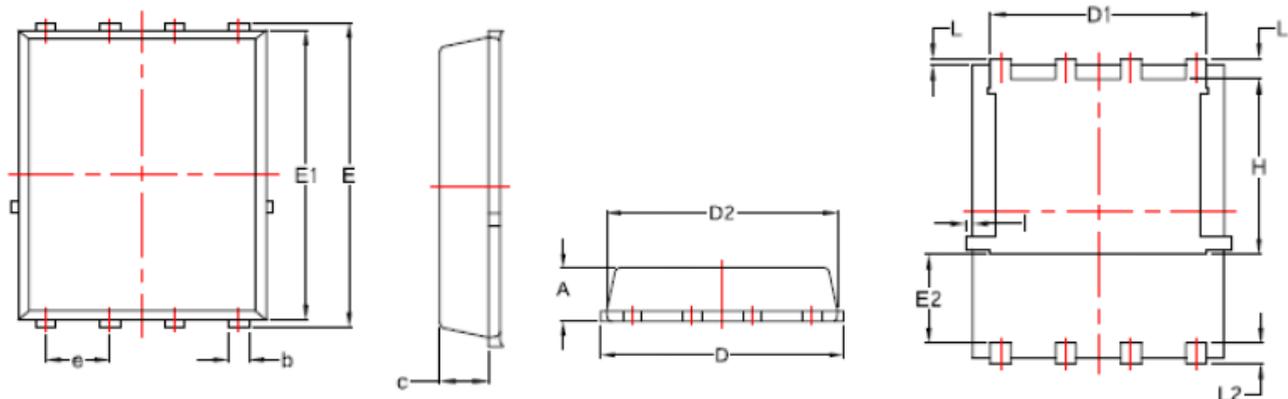


**Fig.10 Switching Time Waveform**



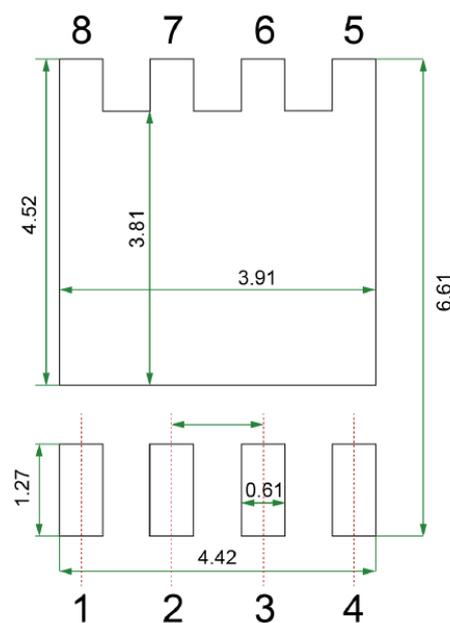
**Fig.11 Unclamped Inductive Switching Waveform**

## DFN5×6 Outline



Land Pattern (Only for Reference)  
Unit : mm

SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.90	1.20	0.0354	0.0474
b	0.30	0.51	0.0118	0.0200
c	0.60	1.046	0.0236	0.0412
D	4.80	5.45	0.1890	0.2146
D1	4.11	4.31	0.1618	0.1697
D2	4.80	5.20	0.1890	0.2047
E	5.90	6.35	0.2323	0.2500
E1	5.65	6.06	0.2224	0.2386
E2	1.10	-	0.0433	-
e	1.27 BSC		0.05 BSC	
L	0.05	0.25	0.0020	0.0098
L1	0.38	0.61	0.0150	0.0240
L2	0.30	0.71	0.0118	0.0280
H	3.30	3.92	0.1300	0.1543
I	-	0.18	-	0.0070



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