

Features

- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- 100% EAS Guaranteed
- Green Device Available

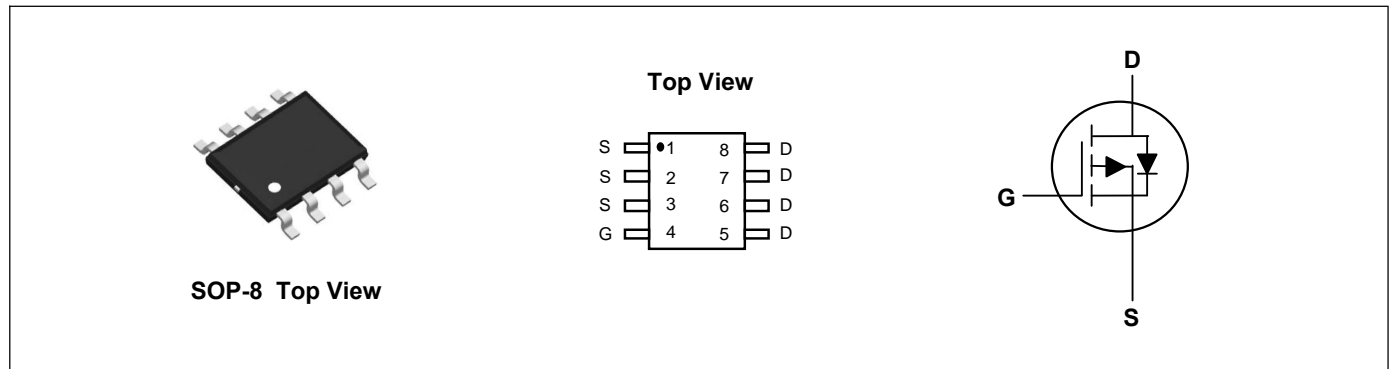
Applications

- High Frequency Point-of-Load, Synchronous Buck Converter for MB/NB/UMPC/VGA
- Networking DC-DC Power System
- Load Switch

Product Summary



V_{DS}	-30	V
I_D	-16.8	A
$R_{DS(ON)}$ (at $V_{GS}=-10V$)	7	m Ω
$R_{DS(ON)}$ (at $V_{GS}=-4.5V$)	11	m Ω



Absolute Maximum Ratings ($T_A=25^\circ\text{C}$, unless otherwise noted)

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current, $V_{GS} @ -10V^1$	$I_D @ T_A=25^\circ\text{C}$	-16.8	A
Continuous Drain Current, $V_{GS} @ -10V^1$	$I_D @ T_A=100^\circ\text{C}$	-10.6	A
Pulsed Drain Current ²	I_{DM}	-120	A
Single Pulse Avalanche Energy ³	EAS	80	mJ
Avalanche Current	I_{AS}	-40	A
Total Power Dissipation ⁴	$P_D @ T_A=25^\circ\text{C}$	3.1	W
Storage Temperature Range	T_{STG}	-55 to 150	$^\circ\text{C}$
Operating Junction Temperature Range	T_J	-55 to 150	$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	Typ	Max	Unit
Thermal Resistance Junction-Ambient ¹ ($t \leq 10s$)	$R_{\theta JA}$	---	40	$^\circ\text{C/W}$
Thermal Resistance Junction-Ambient ¹		---	75	$^\circ\text{C/W}$
Thermal Resistance Junction-Case ¹	$R_{\theta JC}$	---	24	$^\circ\text{C/W}$

Electrical Characteristics ($T_J=25^{\circ}\text{C}$, unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=-250\mu A$	-30	---	---	V
Static Drain-Source On-Resistance ²	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-15A$	---	---	7	m Ω
		$V_{GS}=-4.5V, I_D=-10A$	---	---	11	m Ω
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=-250\mu A$	-1.2	-1.7	-2.5	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=-24V, V_{GS}=0V, T_J=25^{\circ}\text{C}$	---	---	-1	μA
		$V_{DS}=-24V, V_{GS}=0V, T_J=55^{\circ}\text{C}$	---	---	-5	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
Gate Resistance	R_g	$V_{DS}=0V, V_{GS}=0V, f=1\text{MHz}$	---	1.2	---	Ω
Total Gate Charge (-10V)	Q_g	$V_{DS}=-15V, V_{GS}=-10V, I_D=-15A$	---	60	---	nC
Gate-Source Charge	Q_{gs}		---	9	---	
Gate-Drain Charge	Q_{gd}		---	15	---	
Turn-On Delay Time	$T_{d(on)}$	$V_{DD}=-15V, V_{GS}=-10V, R_G=3.3\Omega, I_D=-10A$	---	17	---	ns
Rise Time	T_r		---	40	---	
Turn-Off Delay Time	$T_{d(off)}$		---	55	---	
Fall Time	T_f		---	13	---	
Input Capacitance	C_{iss}	$V_{DS}=-25V, V_{GS}=0V, f=1\text{MHz}$	---	3450	---	pF
Output Capacitance	C_{oss}		---	255	---	
Reverse Transfer Capacitance	C_{rss}		---	140	---	

Drain-Source Diode Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Continuous Source Current ^{1,5}	I_S	$V_G=V_D=0V, \text{Force Current}$	---	---	-16.8	A
Diode Forward Voltage ²	V_{SD}	$V_{GS}=0V, I_S=-1A, T_J=25^{\circ}\text{C}$	---	---	-1.2	V
Reverse Recovery Time	t_{rr}	$I_F=-20A, di/dt=100A/\mu s, T_J=25^{\circ}\text{C}$	---	22	---	nS
Reverse Recovery Charge	Q_{rr}		---	72	---	nC

Note:

- The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
- The EAS data shows Max. rating. The test condition is $V_{DD}=-50V, V_{GS}=-10V, L=0.1\text{mH}, I_{AS}=-40A$
- The power dissipation is limited by 150 $^{\circ}\text{C}$ junction temperature
- The data is theoretically the same as I_D and I_{DM} , in real applications, should be limited by total power dissipation.

Typical Characteristics

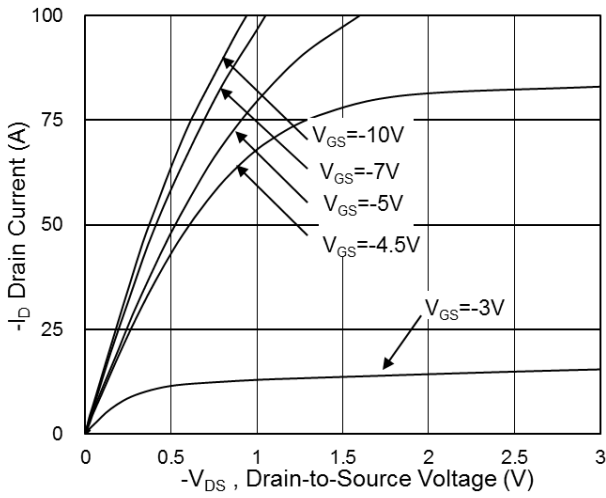


Fig.1 Typical Output Characteristics

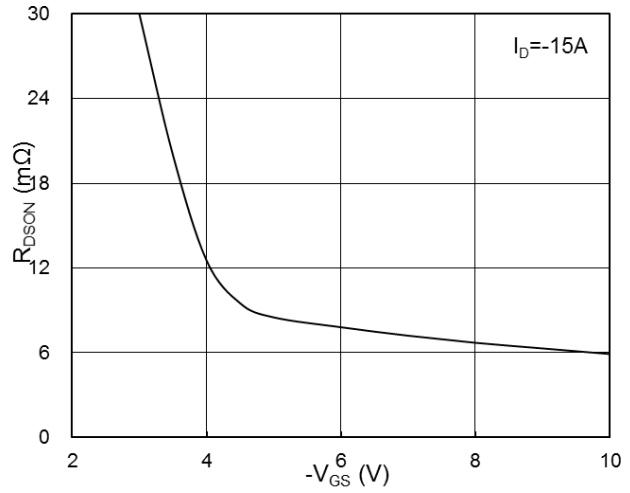


Fig.2 On-Resistance vs. Gate-Source Voltage

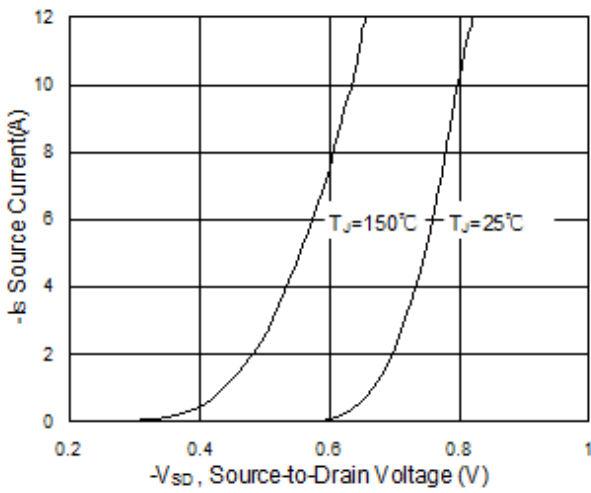


Fig.3 Forward Characteristics of Reverse

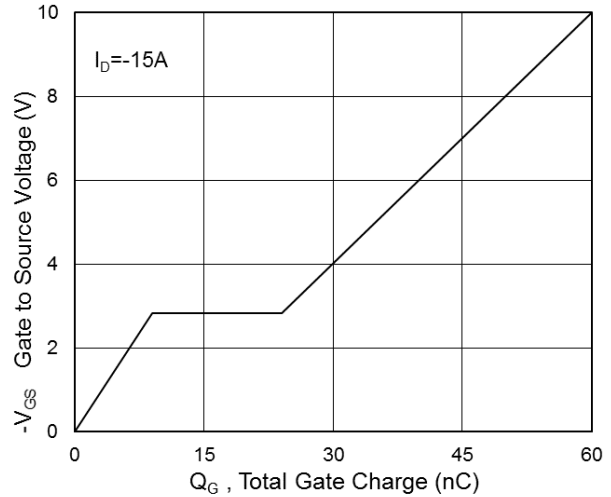


Fig.4 Gate-Charge Characteristics

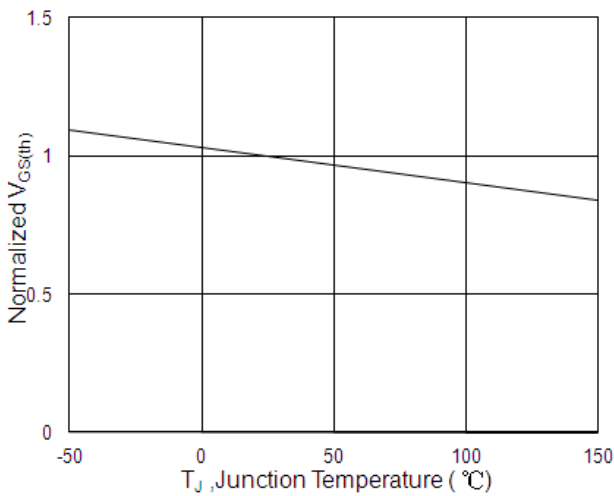


Fig.5 Normalized $-V_{GS(th)}$ vs. T_J

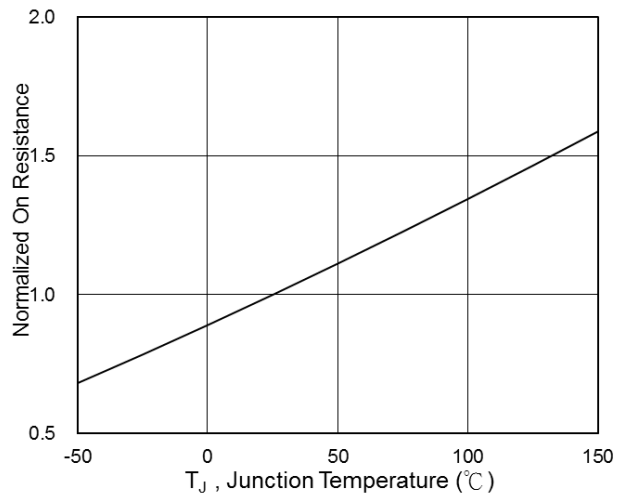


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

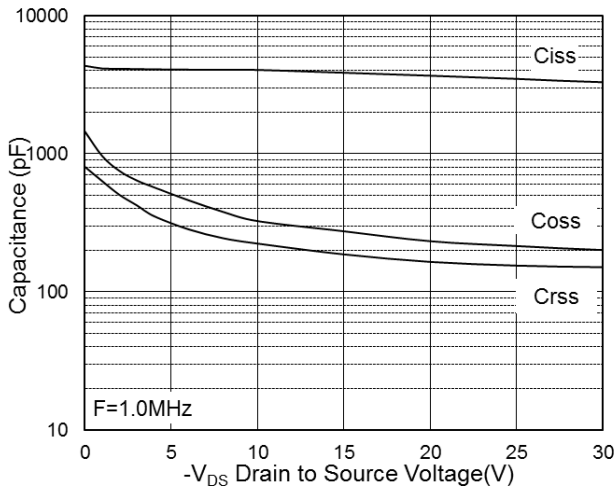


Fig.7 Capacitance

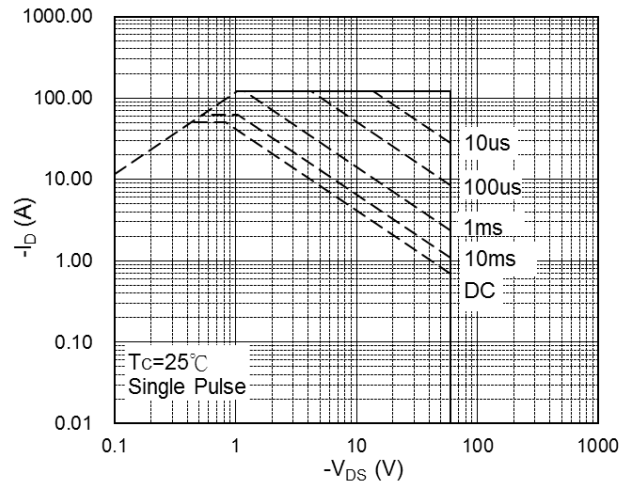


Fig.8 Safe Operating Area

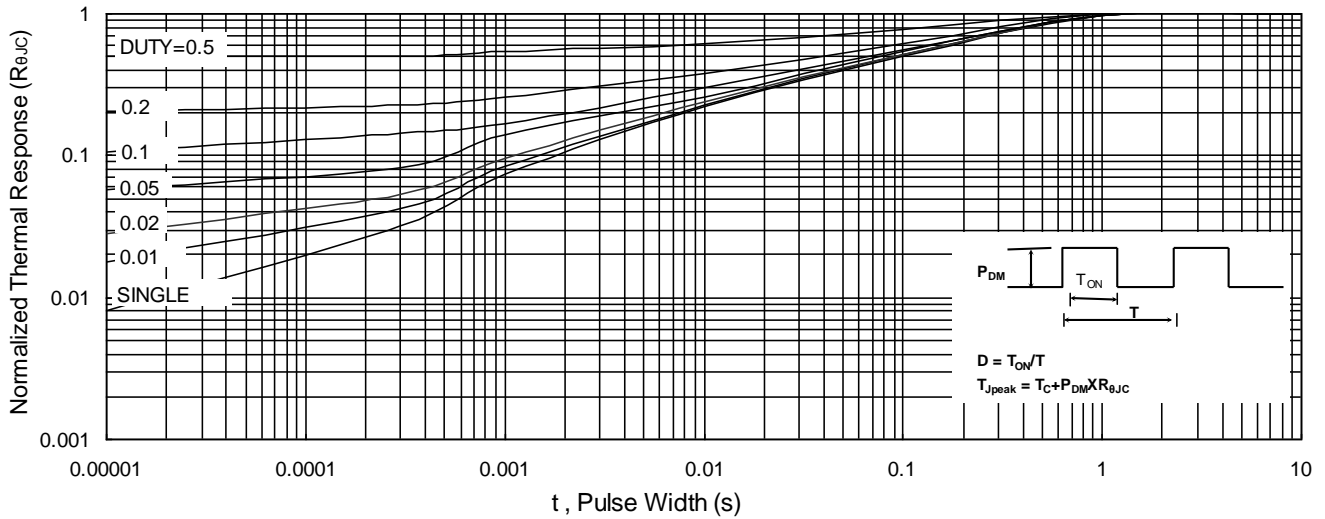


Fig.9 Normalized Maximum Transient Thermal Impedance

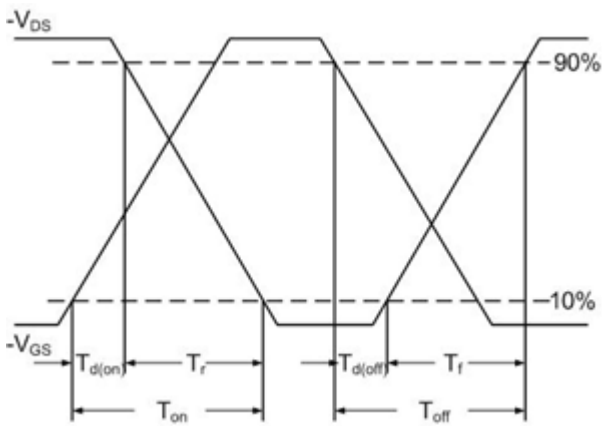


Fig.10 Switching Time Waveform

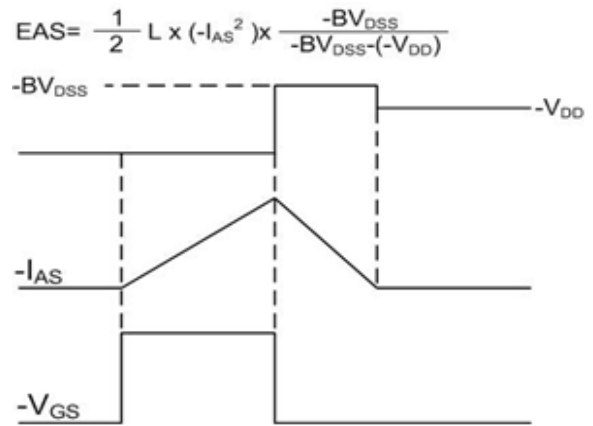
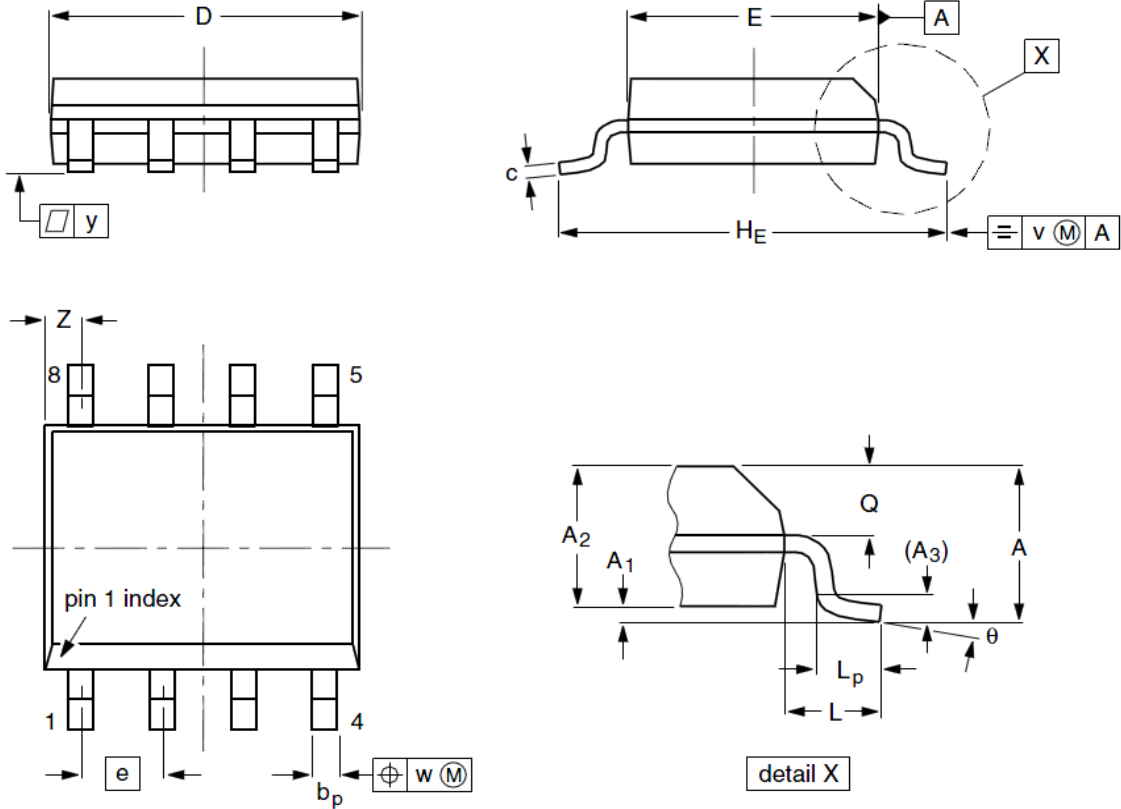


Fig.11 Unclamped Inductive Switching Waveform

SOP-8 Package Outline Dimensions



Symbol	Dimensions (unit:mm)			Symbol	Dimensions (unit:mm)		
	Min	Typ	Max		Min	Typ	Max
A	1.35	1.55	1.75	A₁	0.10	0.18	0.25
A₂	1.25	1.45	1.65	A₃	--	0.25	--
b_p	0.36	0.42	0.51	c	0.19	0.22	0.25
D	4.70	4.92	5.10	E	3.80	3.90	4.00
e	--	1.27	--	H_E	5.80	6.00	6.20
L	--	1.05	--	L_p	0.40	0.68	1.00
Q	0.60	0.65	0.73	v	--	0.25	--
w	--	0.25	--	y	--	0.10	--
Z	0.30	0.50	0.70	θ	0°		8°