

## Features

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

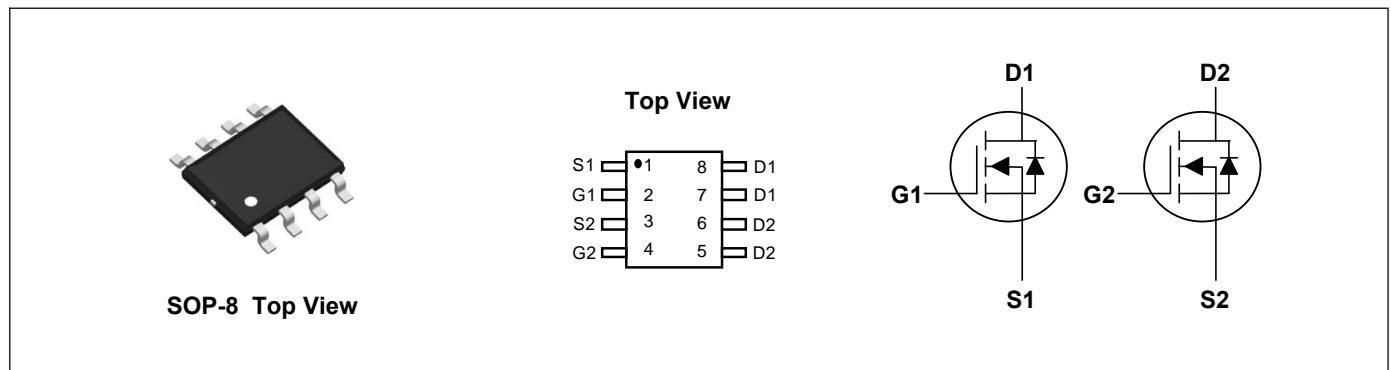
## Applications

- High Frequency Point-of-Load, Synchronous Buck Converter
- Networking DC-DC Power System
- Load Switch

## Product Summary



$V_{DS}$	30	V
$I_D$	6	A
$R_{DS(ON)}$ (at $V_{GS}=10V$ )	19	m $\Omega$
$R_{DS(ON)}$ (at $V_{GS}=4.5V$ )	26	m $\Omega$



## 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	$V_{GS}$	$\pm 20$	V
Continuous Drain Current <sup>1</sup>	$I_D$	6	A
Continuous Drain Current <sup>1</sup>	$I_D$	4.8	A
Pulsed Drain Current <sup>2</sup>	$I_{DM}$	15	A
Single Pulse Avalanche Energy <sup>3</sup>	EAS	10	mJ
Avalanche Current	$I_{AS}$	14	A
Total Power Dissipation <sup>4</sup>	$P_D$	1.1	W
Total Power Dissipation <sup>4</sup>	$P_D$	0.7	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 <sup>1</sup> ( $t \leq 10s$ )	$R_{\theta JA}$	---	62.5	$^\circ\text{C/W}$
Thermal Resistance Junction-Ambient <sup>1</sup> (Steady State)		---	110	$^\circ\text{C/W}$

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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	30	---	---	V
Static Drain-Source On-Resistance <sup>2</sup>	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =10A	---	16	19	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =5A	---	20	26	mΩ
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250uA	1	1.5	2	V
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =24V, V <sub>GS</sub> =0V, T <sub>J</sub> =25°C	---	---	1	uA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	---	---	±100	nA
Forward Transconductance	g <sub>fs</sub>	V <sub>DS</sub> =5V, I <sub>D</sub> =10A	---	8	---	S
Gate Resistance	R <sub>g</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =0V, f=1MHz	---	3.3	---	Ω
Total Gate Charge	Q <sub>g</sub>	V <sub>DD</sub> =15V, V <sub>GS</sub> =10V, I <sub>D</sub> =10A	---	15.4	---	nC
Gate-Source Charge	Q <sub>gs</sub>		---	1.3	---	
Gate-Drain Charge	Q <sub>gd</sub>		---	4.8	---	
Turn-On Delay Time	T <sub>d(on)</sub>	V <sub>DD</sub> =15V, V <sub>GS</sub> =10V, R <sub>G</sub> =6Ω, I <sub>D</sub> =1A	---	3.2	---	ns
Rise Time	T <sub>r</sub>		---	21.6	---	
Turn-Off Delay Time	T <sub>d(off)</sub>		---	25	---	
Fall Time	T <sub>f</sub>		---	18.2	---	
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f=1MHz	---	500	---	pF
Output Capacitance	C <sub>oss</sub>		---	62	---	
Reverse Transfer Capacitance	C <sub>rss</sub>		---	53	---	

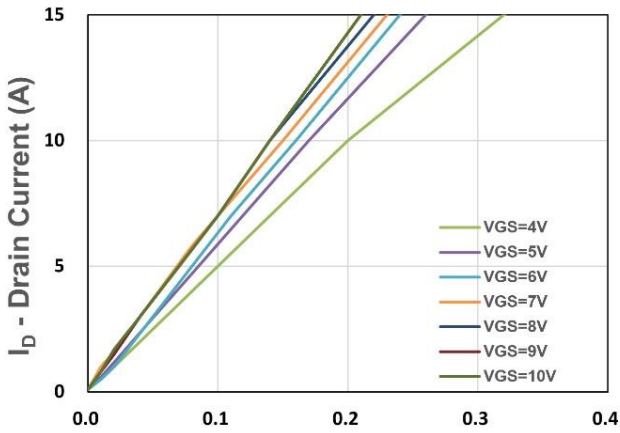
**Drain-Source Diode Characteristics**

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Diode Forward Voltage <sup>2</sup>	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =1A, T <sub>J</sub> =25°C	---	0.7	1.1	V
Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> =1A, di/dt=100A/μs, T <sub>J</sub> =25°C	---	9	---	nS
Reverse Recovery Charge	Q <sub>rr</sub>		---	3	---	nC

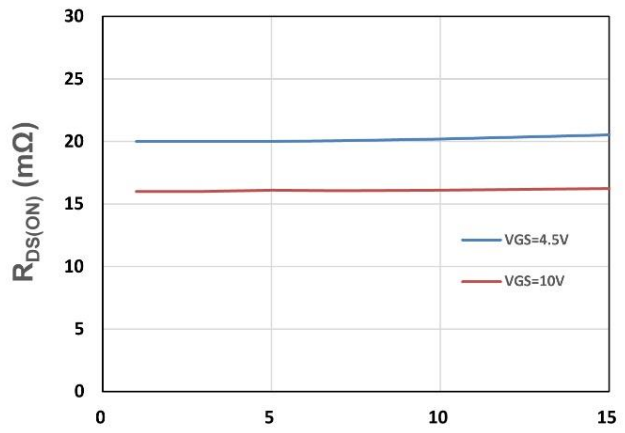
**Note:**

- 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 EAS data shows Max. rating. The test condition is V<sub>DD</sub>=25V, V<sub>GS</sub>=10V, L=0.1mH
- 4.The power dissipation is limited by 150°C junction temperature

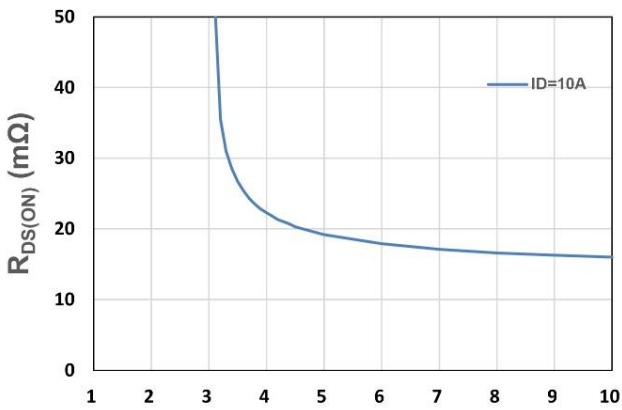
**Typical Characteristics**



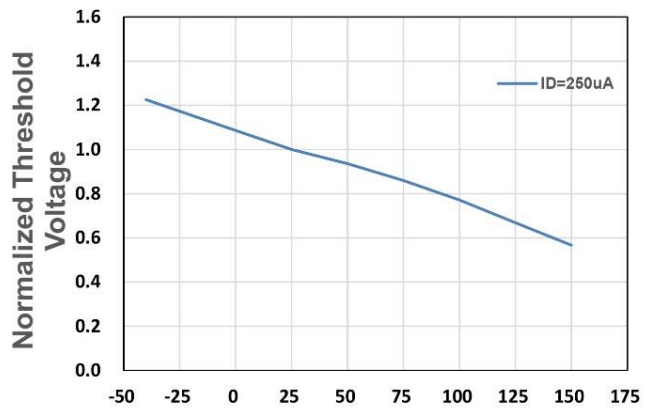
**V<sub>DS</sub> - Drain - Source Voltage (V)**  
Figure 1. Output Characteristics



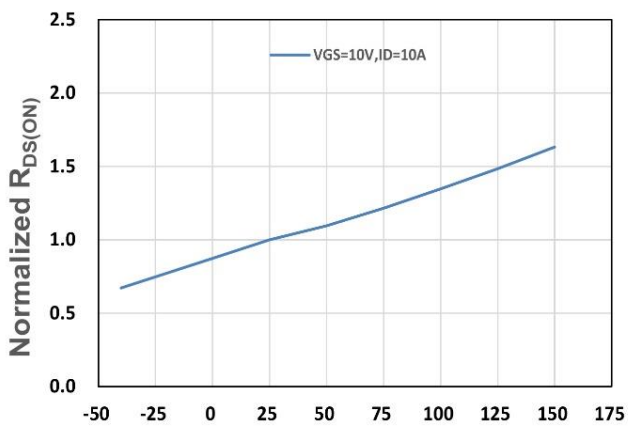
**I<sub>D</sub>- Drain Current (A)**  
Figure 2. On-Resistance vs. ID



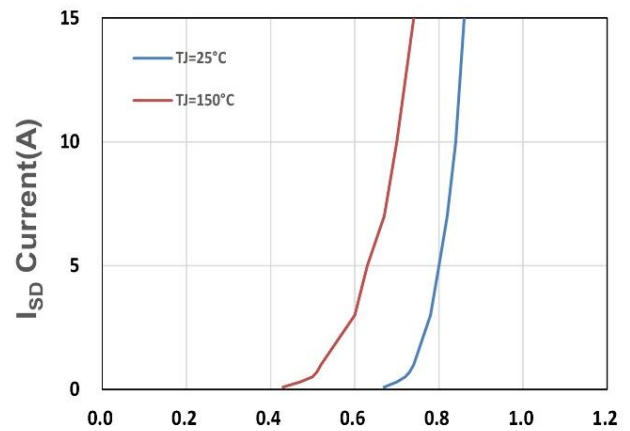
**V<sub>GS</sub> - Gate - Source Voltage (V)**  
Figure 3. On-Resistance vs. VGS



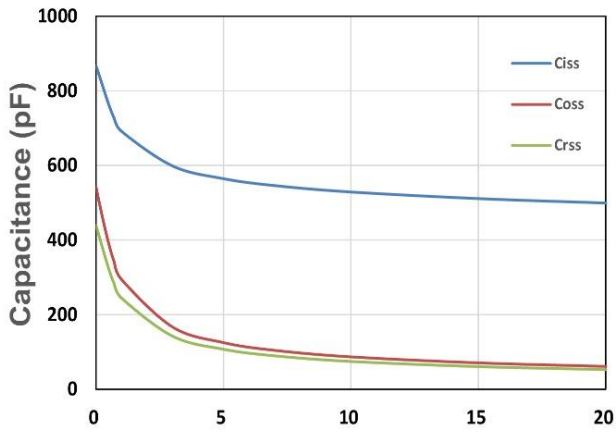
**T<sub>j</sub>, Junction Temperature(°C)**  
Figure 4. Gate Threshold Voltage



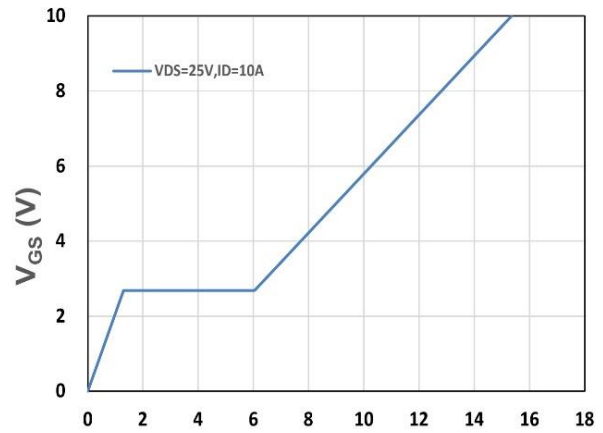
**T<sub>j</sub>, Junction Temperature(°C)**  
Figure 5. Drain-Source On Resistance



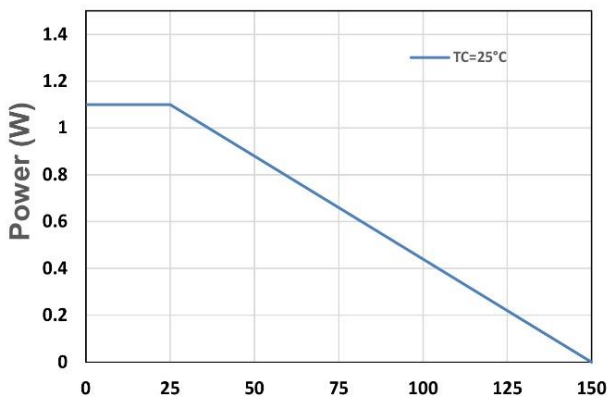
**V<sub>SD</sub>, Source-Drain Voltage(V)**  
Figure 6. Source-Drain Diode Forward



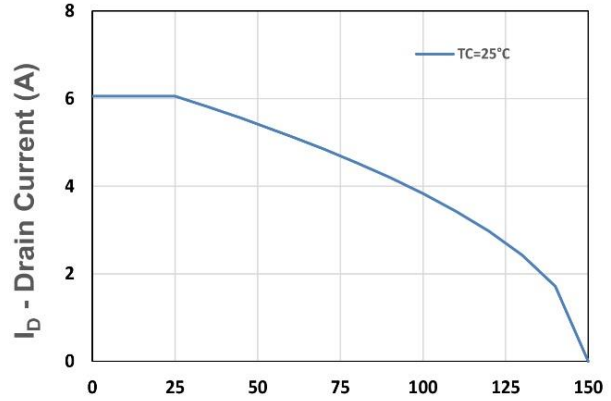
$V_{DS}$  - Drain - Source Voltage (V)  
Figure 7. Capacitance



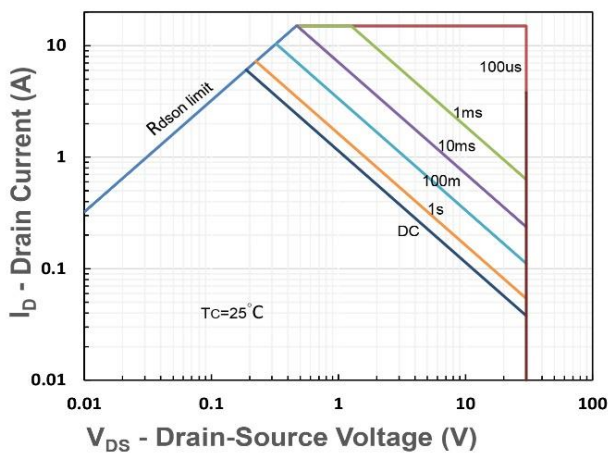
$Q_g$ , Total Gate Charge (nC)  
Figure 8. Gate Charge Characteristics



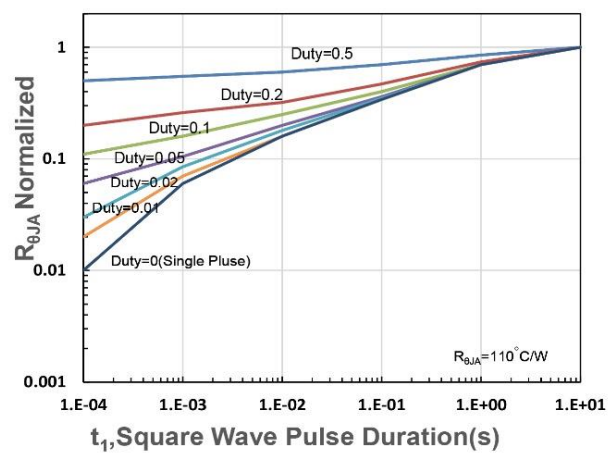
$T_j$  - Junction Temperature (°C)  
Figure 9. Power Dissipation



$T_j$  - Junction Temperature (°C)  
Figure 10. Drain Current

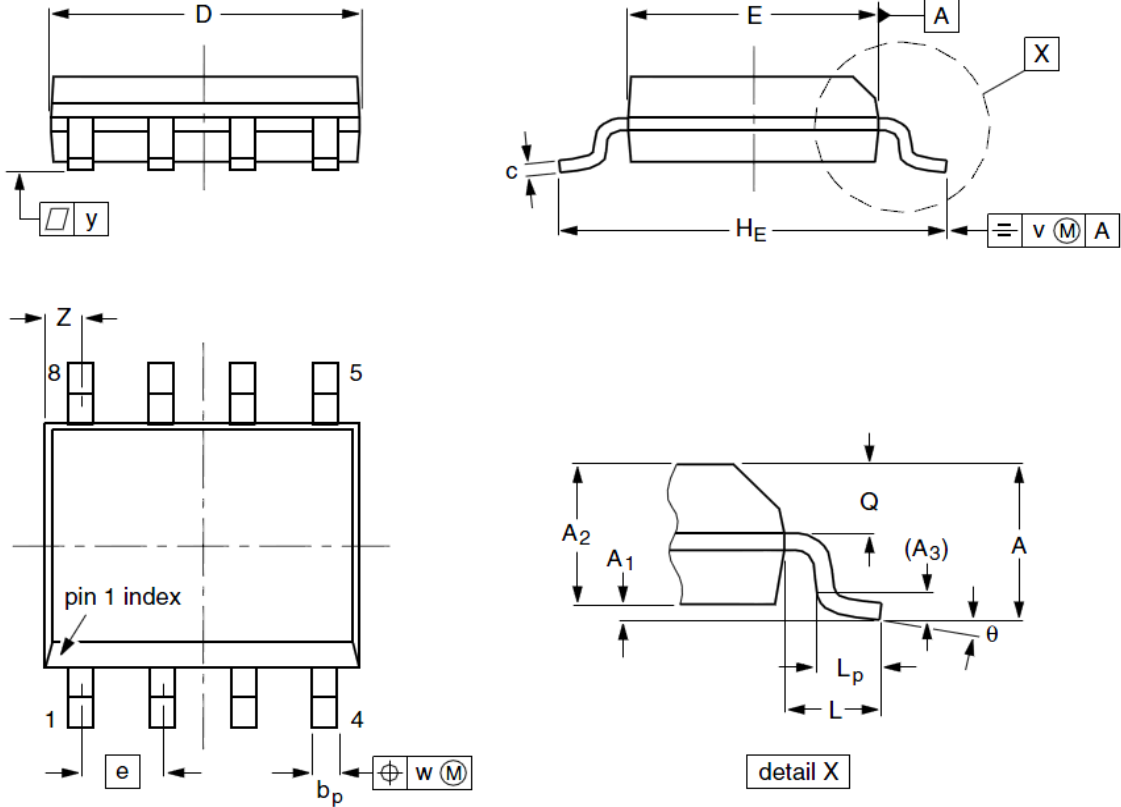


$V_{DS}$  - Drain-Source Voltage (V)  
Figure 11. Safe Operating Area



$t_1$ , Square Wave Pulse Duration (s)  
Figure 12.  $R_{\theta JA}$  Transient Thermal Impedance

**SOP-8 Package Outline Dimensions**



Symbol	Dimensions (unit:mm)			Symbol	Dimensions (unit:mm)		
	Min	Typ	Max		Min	Typ	Max
<b>A</b>	1.35	1.55	1.75	<b>A<sub>1</sub></b>	0.10	0.18	0.25
<b>A<sub>2</sub></b>	1.25	1.45	1.65	<b>A<sub>3</sub></b>	--	0.25	--
<b>b<sub>p</sub></b>	0.36	0.42	0.51	<b>c</b>	0.19	0.22	0.25
<b>D</b>	4.70	4.92	5.10	<b>E</b>	3.80	3.90	4.00
<b>e</b>	--	1.27	--	<b>H<sub>E</sub></b>	5.80	6.00	6.20
<b>L</b>	--	1.05	--	<b>L<sub>p</sub></b>	0.40	0.68	1.00
<b>Q</b>	0.60	0.65	0.73	<b>v</b>	--	0.25	--
<b>w</b>	--	0.25	--	<b>y</b>	--	0.10	--
<b>Z</b>	0.30	0.50	0.70	<b>θ</b>	0°		8°