

Features

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

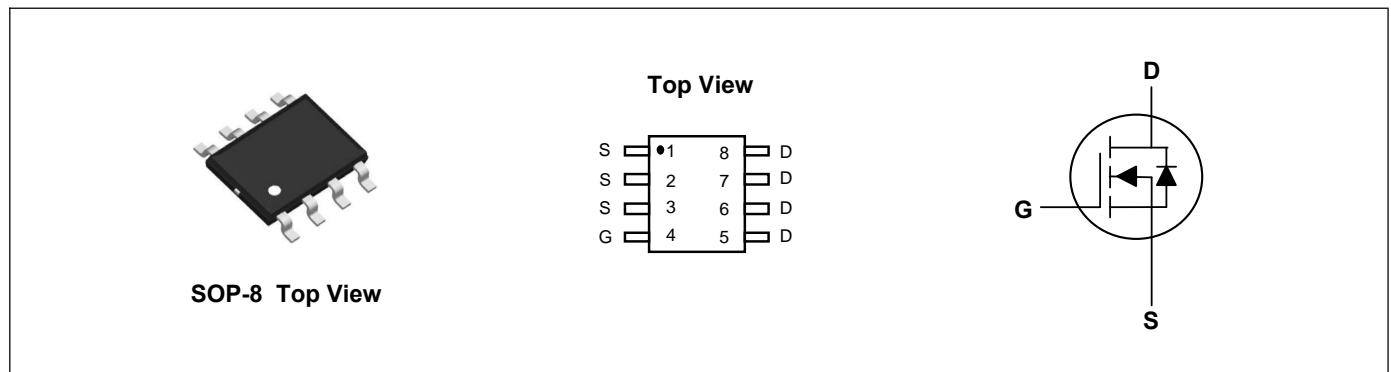
Applications

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

Product Summary



V_{DS}	60	V
I_D	14	A
$R_{DS(ON)}$ (at $V_{GS}=10V$)	10.4	m Ω
$R_{DS(ON)}$ (at $V_{GS}=6V$)	16	m Ω



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

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ¹	$I_D@T_A=25^\circ C$	14	A
Continuous Drain Current ¹	$I_D@T_A=70^\circ C$	11	A
Pulsed Drain Current ²	I_{DM}	35	A
Single Pulse Avalanche Energy ³	EAS	45	mJ
Avalanche Current	I_{AS}	30	A
Total Power Dissipation ⁴	$P_D@T_A=25^\circ C$	4.2	W
Total Power Dissipation ⁴	$P_D@T_A=70^\circ C$	2.7	W
Storage Temperature Range	T_{STG}	-55 to 150	$^\circ C$
Operating Junction Temperature Range	T_J	-55 to 150	$^\circ C$

Thermal Characteristics

Parameter	Symbol	Typ	Max	Unit
Thermal Resistance Junction-Ambient ¹	$R_{\theta JA}$	---	75	$^\circ C/W$
Thermal Resistance Junction-Case ¹	$R_{\theta JC}$	---	30	$^\circ C/W$

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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	60	---	---	V
Static Drain-Source On-Resistance ²	$R_{DS(ON)}$	$V_{GS}=10V, I_D=15A$	---	8.7	10.4	m Ω
		$V_{GS}=6V, I_D=8A$	---	12	16	m Ω
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	2	2.8	4	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=48V, V_{GS}=0V$	---	---	1	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
Forward Transconductance	gfs	$V_{DS}=5V, I_D=7.5A$	---	20	---	S
Total Gate Charge	Q_g	$V_{DS}=30V, V_{GS}=10V, I_D=15A$	---	52.5	---	nC
Gate-Source Charge	Q_{gs}		---	20	---	
Gate-Drain Charge	Q_{gd}		---	12.2	---	
Turn-On Delay Time	$T_{d(on)}$	$V_{DS}=30V, V_{GS}=10V, R_G=6\Omega, I_D=1A$	---	17.2	---	ns
Rise Time	T_r		---	14	---	
Turn-Off Delay Time	$T_{d(off)}$		---	59	---	
Fall Time	T_f		---	38	---	
Input Capacitance	C_{iss}	$V_{DS}=30V, V_{GS}=0V, f=1\text{MHz}$	---	2488	---	pF
Output Capacitance	C_{oss}		---	178	---	
Reverse Transfer Capacitance	C_{rss}		---	115	---	

Drain-Source Diode Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Diode Forward Voltage ²	V_{SD}	$V_{GS}=0V, I_S=7.5A, T_J=25^{\circ}\text{C}$	---	0.8	1.1	V
Reverse Recovery Time	t_{rr}	$I_F=7.5A, V_R=0V$ $di/dt=100A/\mu s, T_J=25^{\circ}\text{C}$	---	26	---	nS
Reverse Recovery Charge	Q_{rr}		---	32	---	nC

Note:

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2.The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
- 3.The EAS data shows Max. rating . The test condition is $V_{DD}=25V, V_{GS}=10V, L=0.1\text{mH}$
- 4.The power dissipation is limited by 150°C junction temperature

Typical Characteristics

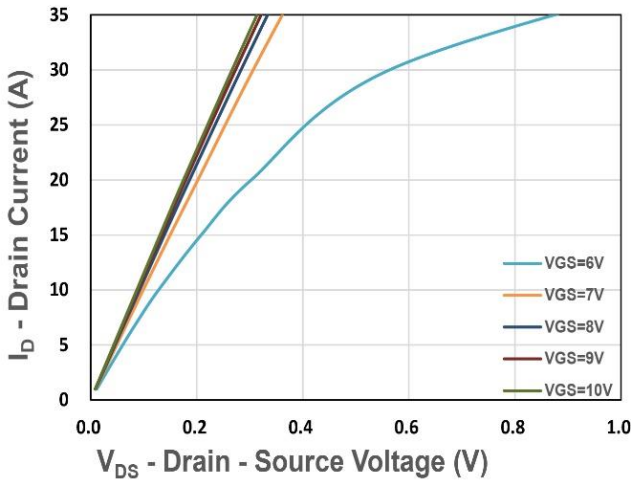


Figure 1. Output Characteristics

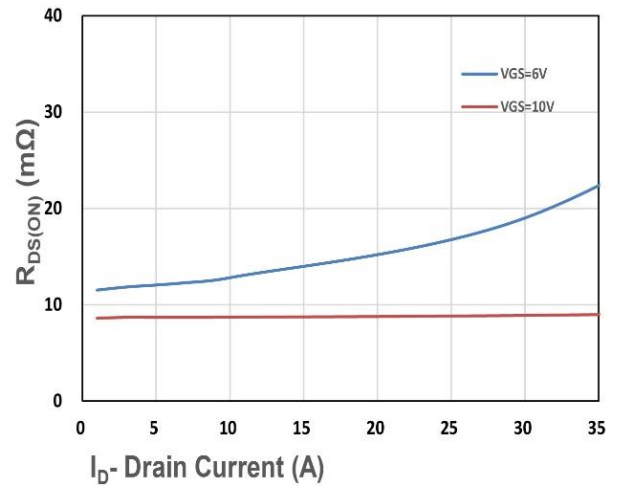


Figure 2. On-Resistance vs. ID

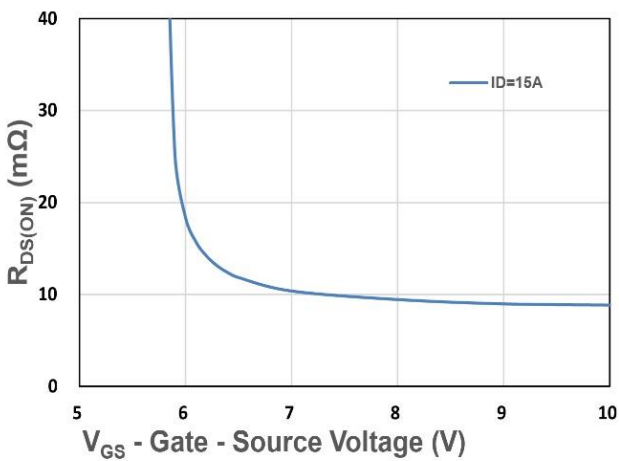


Figure 3. On-Resistance vs. VGS

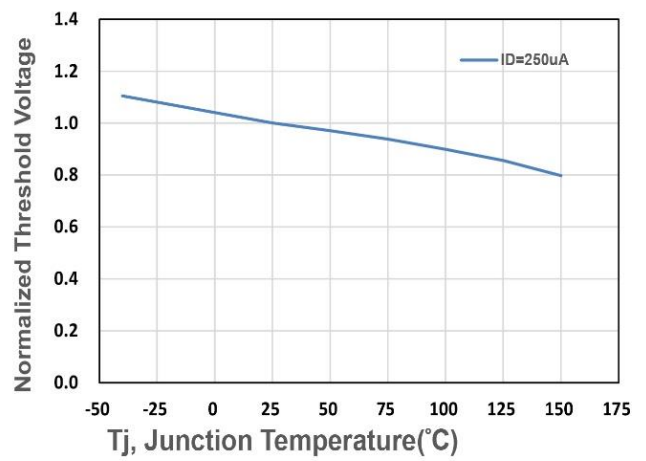


Figure 4. Gate Threshold Voltage

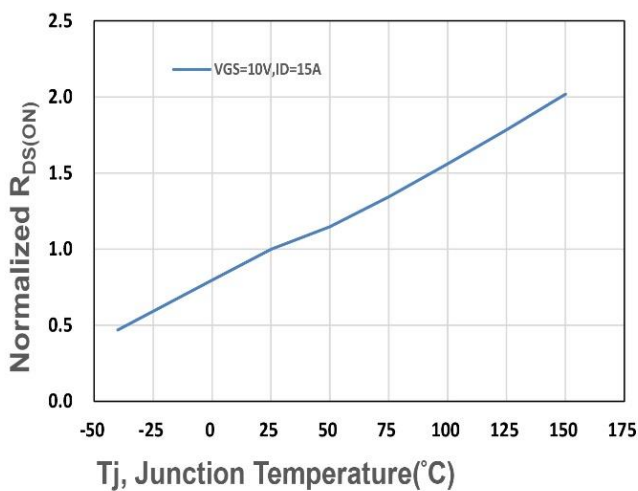


Figure 5. Drain-Source On Resistance

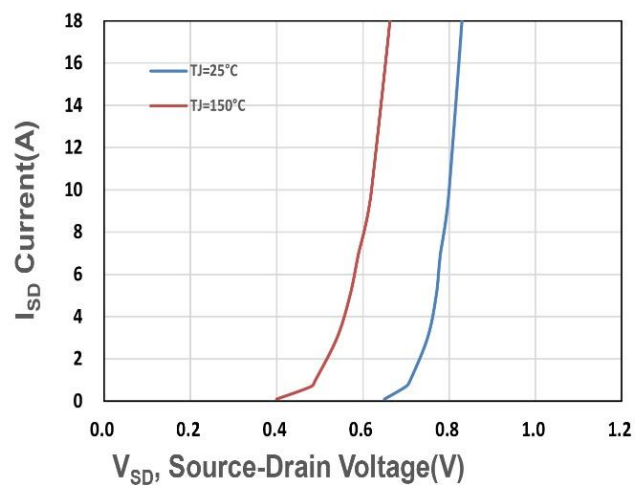
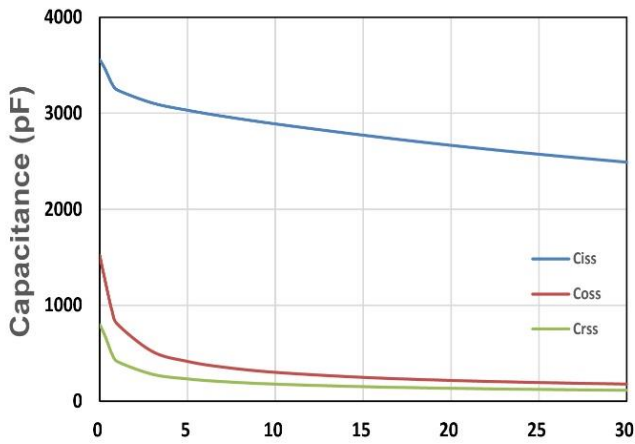
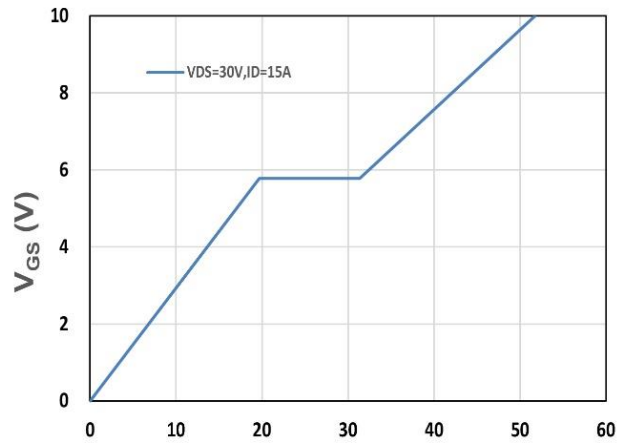


Figure 6. Source-Drain Diode Forward



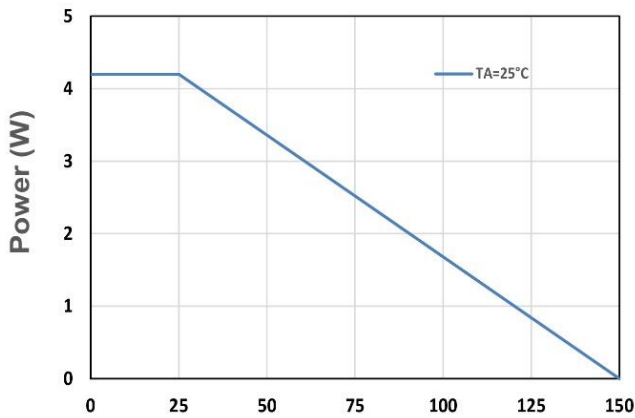
V_{DS} - Drain - Source Voltage (V)

Figure 7. Capacitance



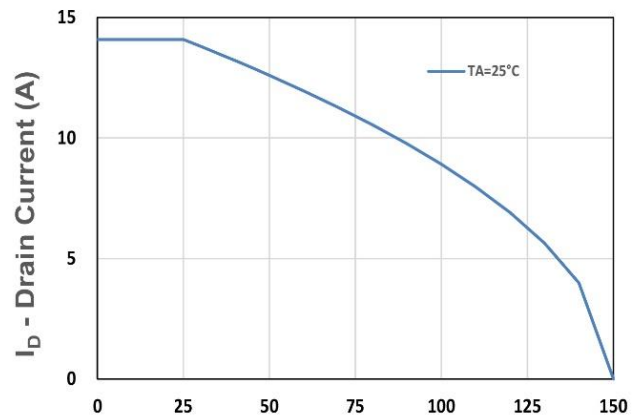
Q_g , Total Gate Charge (nC)

Figure 8. Gate Charge Characteristics



T_A - Junction Temperature (°C)

Figure 9. Power Dissipation



T_A - Junction Temperature (°C)

Figure 10. Drain Current

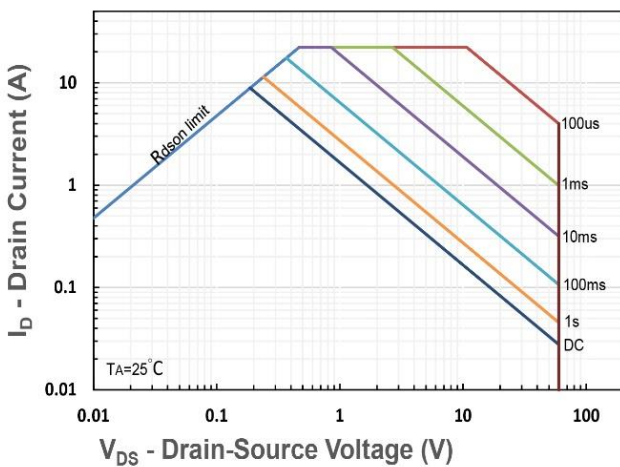


Figure 11. Safe Operating Area

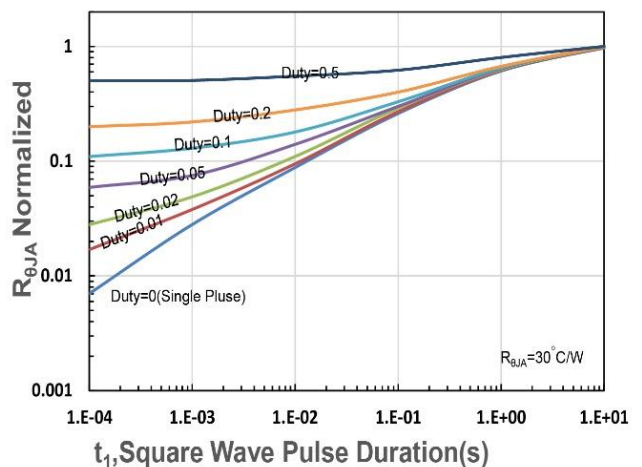


Figure 12. $R_{\theta JA}$ Transient Thermal Impedance

SOP-8 Package Outline Dimensions



Symbol	Dimensions (unit:mm)			Symbol	Dimensions (unit:mm)		
	Min	Typ	Max		Min	Typ	Max
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°