

**Features**

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

**Product Summary**



$V_{DS}$	-20	V
$I_D$	-6	A
$R_{DS(ON)}$ (at $V_{GS}=-4.5V$ )	33	m $\Omega$
$R_{DS(ON)}$ (at $V_{GS}=-2.5V$ )	38	m $\Omega$

**Applications**

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



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

Parameter	Symbol	Rating	Units
Drain-Source Voltage	$V_{DS}$	-20	V
Gate-Source Voltage	$V_{GS}$	$\pm 12$	V
Continuous Drain Current <sup>1</sup>	$I_D$	-6	A
Pulsed Drain Current <sup>2</sup>	$I_{DM}$	-18	A
Total Power Dissipation <sup>3</sup>	$P_D$	1.0	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 <sup>1</sup>	$R_{\theta JA}$	---	100	$^{\circ}C/W$

**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	-20	---	---	V
Static Drain-Source On-Resistance <sup>2</sup>	R <sub>DS(ON)</sub>	V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-6A	---	25	33	mΩ
		V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-3A	---	30	38	mΩ
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =-250uA	-0.4	---	-1.2	V
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =-20V, V <sub>GS</sub> =0V	---	---	-1	uA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±12V, V <sub>DS</sub> =0V	---	---	±25	nA
Forward Transconductance	g <sub>fs</sub>	V <sub>DS</sub> =-5V, I <sub>D</sub> =-2.8A	---	6.5	---	S
Gate Resistance	R <sub>g</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =0V, f=1MHz	---	6	---	Ω
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =-10V, V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-3A	---	5	---	nC
Gate-Source Charge	Q <sub>gs</sub>		---	1	---	
Gate-Drain Charge	Q <sub>gd</sub>		---	1.3	---	
Turn-On Delay Time	T <sub>d(on)</sub>	V <sub>DS</sub> =-10V, V <sub>GS</sub> =-4.5V, R <sub>G</sub> =6Ω, I <sub>D</sub> =-3A	---	11	---	ns
Rise Time	T <sub>r</sub>		---	35	---	
Turn-Off Delay Time	T <sub>d(off)</sub>		---	290	---	
Fall Time	T <sub>f</sub>		---	10	---	
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =-10V, V <sub>GS</sub> =0V, f=1MHz	---	1950	---	pF
Output Capacitance	C <sub>oss</sub>		---	800	---	
Reverse Transfer Capacitance	C <sub>rss</sub>		---	50	---	

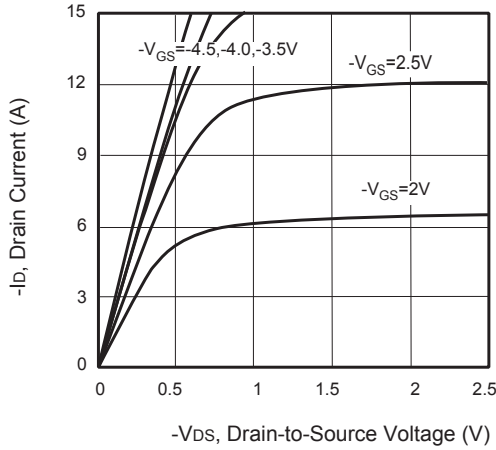
**Drain-Source Diode Characteristics**

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	---	-0.8	-1.2	V
Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> =-3A, di/dt=500A/μs	---	27	---	nS
Reverse Recovery Charge	Q <sub>rr</sub>		---	55	---	nC

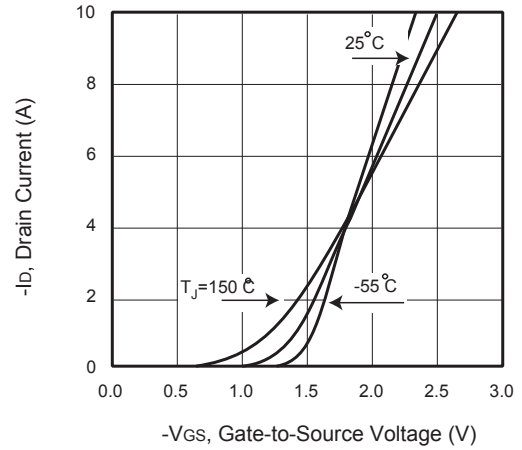
**Note:**

- 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

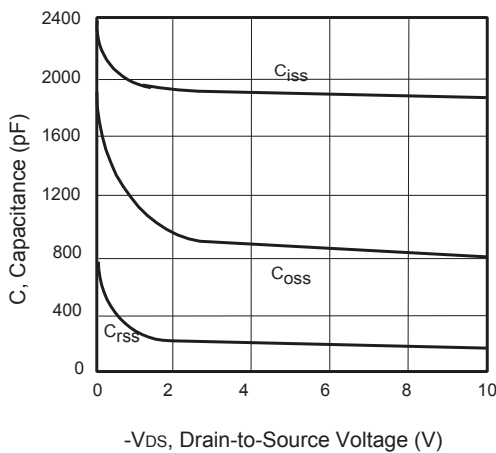
**Typical Characteristics**



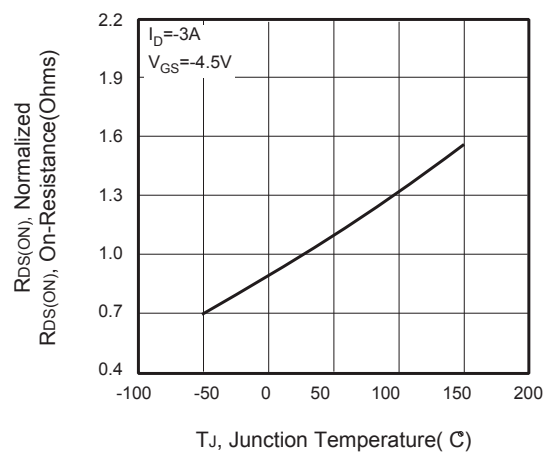
**Figure 1. Output Characteristics**



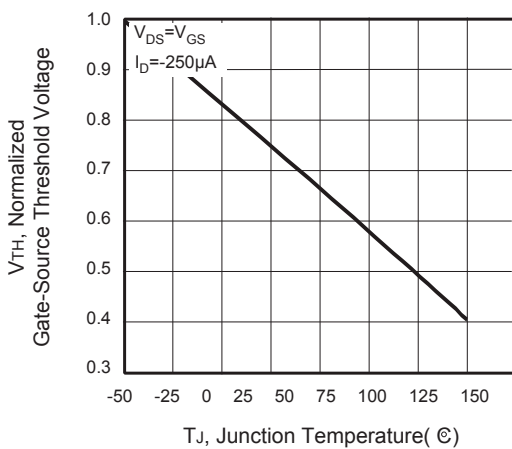
**Figure 2. Transfer Characteristics**



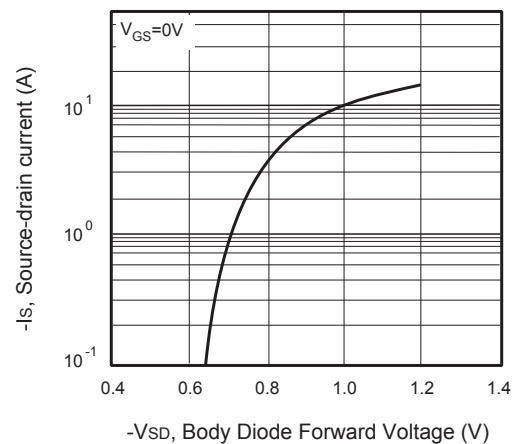
**Figure 3. Capacitance**



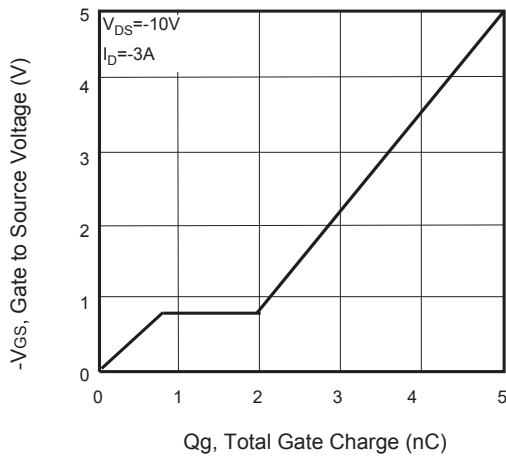
**Figure 4. On-Resistance Variation with Temperature**



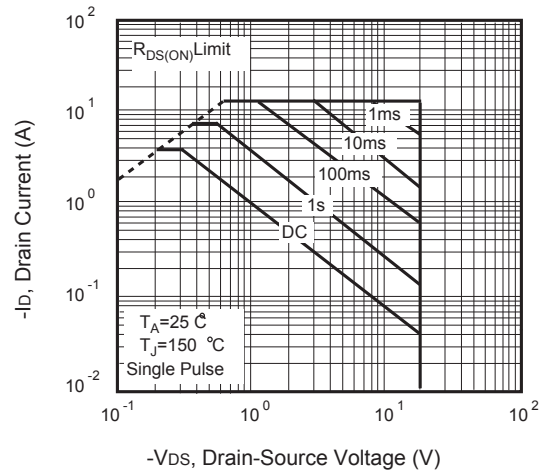
**Figure 5. Gate Threshold Variation with Temperature**



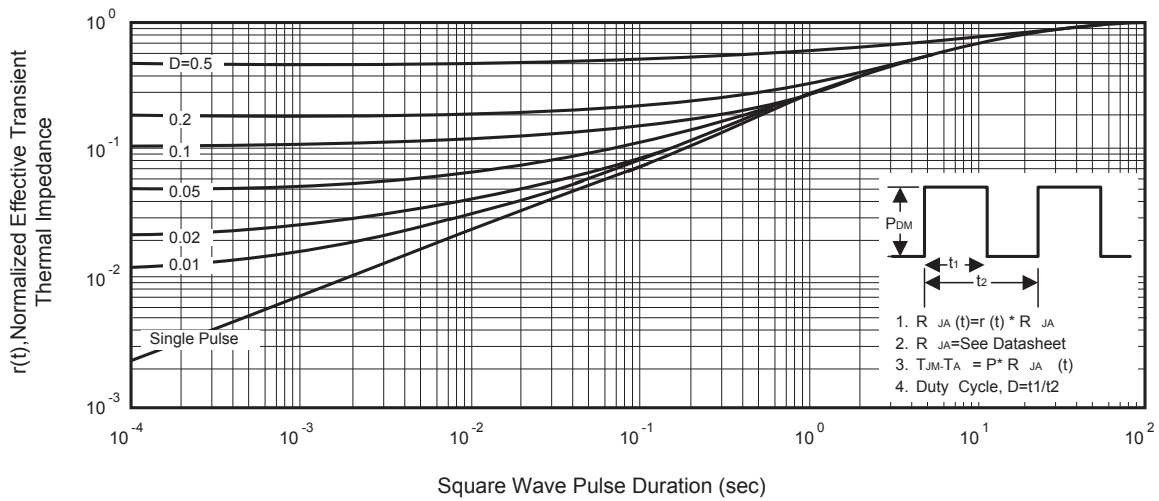
**Figure 6. Body Diode Forward Voltage Variation with Source Current**



**Figure 7. Gate Charge**

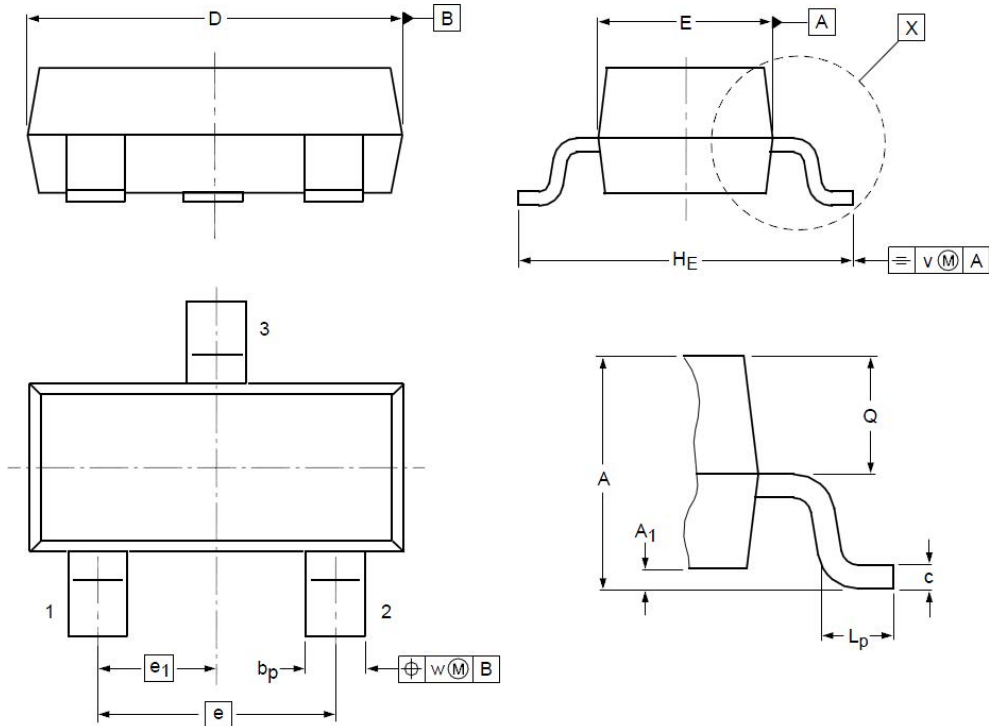


**Figure 8. Maximum Safe Operating Area**



**Figure 9. Normalized Thermal Transient Impedance Curve**

**SOT23-3L Package Outline Dimensions**



Symbol	Dimensions (unit:mm)			Symbol	Dimensions (unit:mm)		
	Min	Typ	Max		Min	Typ	Max
<b>A</b>	0.90	1.07	1.25	<b>e<sub>1</sub></b>	--	0.95	--
<b>A<sub>1</sub></b>	0.01	0.05	0.10	<b>H<sub>E</sub></b>	2.50	2.80	3.00
<b>b<sub>p</sub></b>	0.30	0.40	0.50	<b>L<sub>p</sub></b>	0.30	0.45	0.60
<b>c</b>	0.10	0.15	0.20	<b>Q</b>	0.23	0.28	0.33
<b>D</b>	2.70	2.90	3.10	<b>V</b>	--	0.20	--
<b>E</b>	1.40	1.55	1.75	<b>W</b>	--	0.20	--
<b>e</b>	--	1.90	--				