

**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**



$V_{DS}$	-25	V
$I_D$	-120	A
$R_{DS(ON)}$ (at $V_{GS}=-10V$ )	4.5	m $\Omega$
$R_{DS(ON)}$ (at $V_{GS}=-4.5V$ )	6	m $\Omega$



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

Parameter	Symbol	Rating	Units
Drain-Source Voltage	$V_{DS}$	-25	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current <sup>1</sup>	$I_D$	-120	A
Pulsed Drain Current <sup>2</sup>	$I_{DM}$	-360	A
Single Pulse Avalanche Energy <sup>3</sup>	$E_{AS}$	320	mJ
Total Power Dissipation <sup>4</sup>	$P_D$	130	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>	$R_{\theta JA}$	---	62	$^{\circ}C/W$
Thermal Resistance Junction-Case <sup>1</sup>	$R_{\theta JC}$	---	1.1	$^{\circ}C/W$

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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-25	---	---	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-30A$	---	3.5	4.5	$m\Omega$
		$V_{GS}=-4.5V, I_D=-20A$	---	5	6	$m\Omega$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=-250\mu A$	-1.0	---	-2.0	V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=-24V, V_{GS}=0V$	---	---	-1	$\mu A$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	$\pm 100$	nA
Forward Transconductance	$g_{fs}$	$V_{DS}=-10V, I_D=-10A$	---	23	---	S
Total Gate Charge	$Q_g$	$V_{DS}=-15V, V_{GS}=-4.5V, I_D=-20A$	---	95	---	nC
Gate-Source Charge	$Q_{gs}$		---	20	---	
Gate-Drain Charge	$Q_{gd}$		---	50	---	
Turn-On Delay Time	$T_{d(on)}$	$V_{DD}=-15V, V_{GS}=-10V, R_G=6\Omega, I_D=-20A$	---	30	---	ns
Rise Time	$T_r$		---	45	---	
Turn-Off Delay Time	$T_{d(off)}$		---	190	---	
Fall Time	$T_f$		---	175	---	
Input Capacitance	$C_{iss}$	$V_{DS}=-15V, V_{GS}=0V, f=1MHz$	---	5300	---	pF
Output Capacitance	$C_{oss}$		---	1950	---	
Reverse Transfer Capacitance	$C_{rss}$		---	450	---	

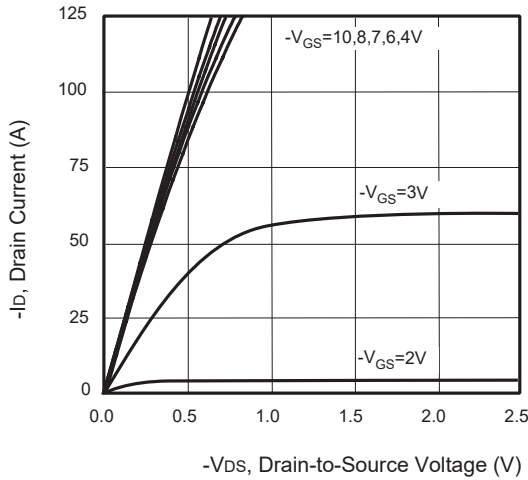
**Drain-Source Diode Characteristics**

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Continuous Source Current <sup>1</sup>	$I_S$		---	---	-120	A
Diode Forward Voltage <sup>2</sup>	$V_{SD}$	$V_{GS}=0V, I_S=-20A, T_J=25^{\circ}\text{C}$	---	---	-1.2	V

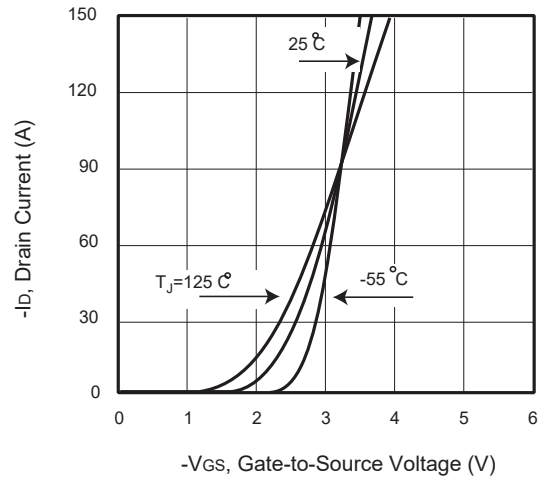
**Note:**

- 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  $\leq 300\mu s$  , duty cycle  $\leq 2\%$
- 3.The EAS data shows Max. rating . The test condition is  $V_{DD}=-15V, V_{GS}=-10V$
- 4.The power dissipation is limited by 150 $^{\circ}\text{C}$  junction temperature

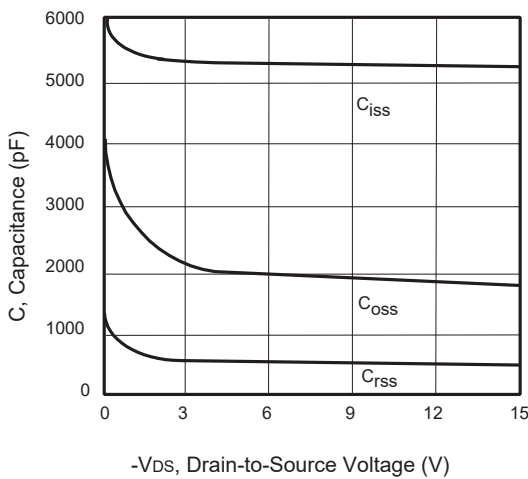
**Typical Characteristics**



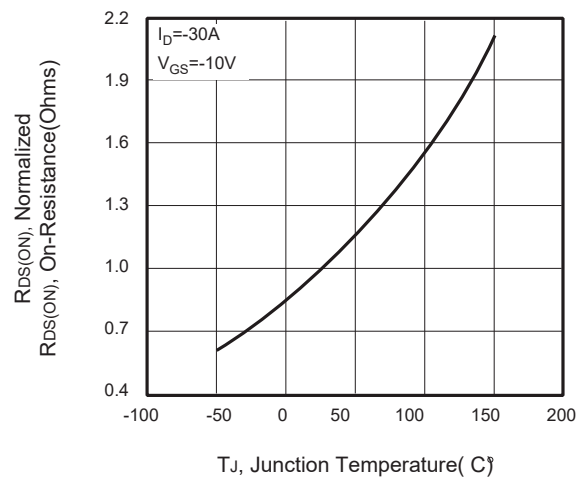
**Figure 1. Output Characteristics**



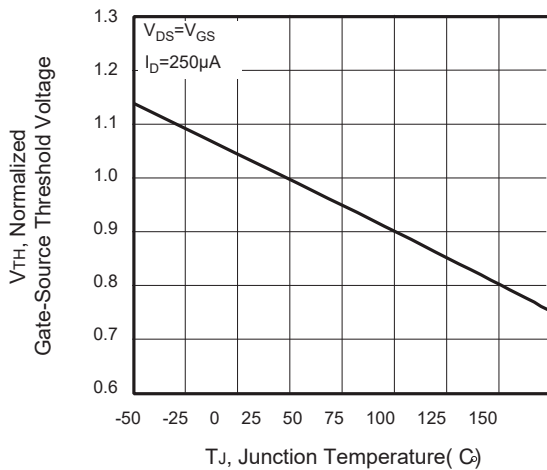
**Figure 2. Transfer Characteristics**



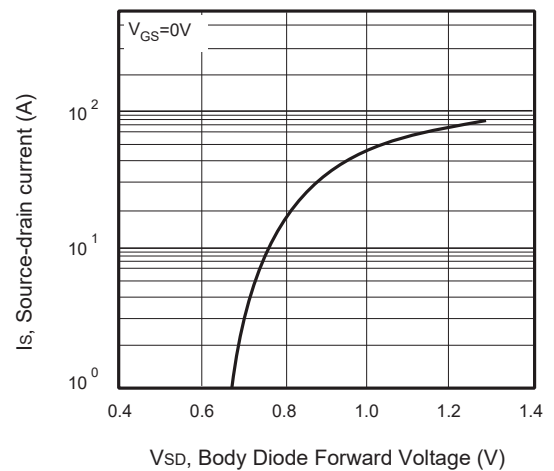
**Figure 3. Capacitance**



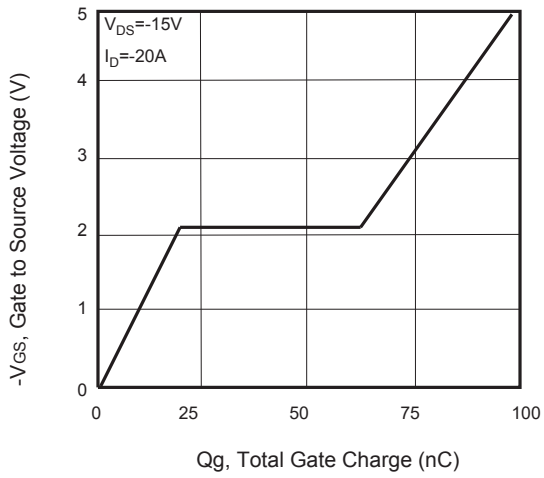
**Figure 4. On-Resistance Variation with Temperature**



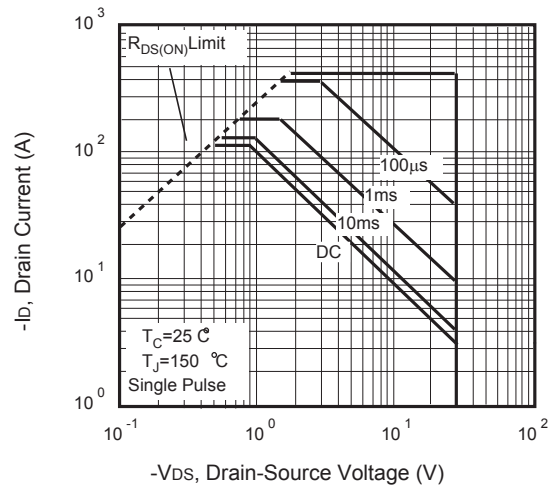
**Figure 5. Gate Threshold Variation with Temperature**



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

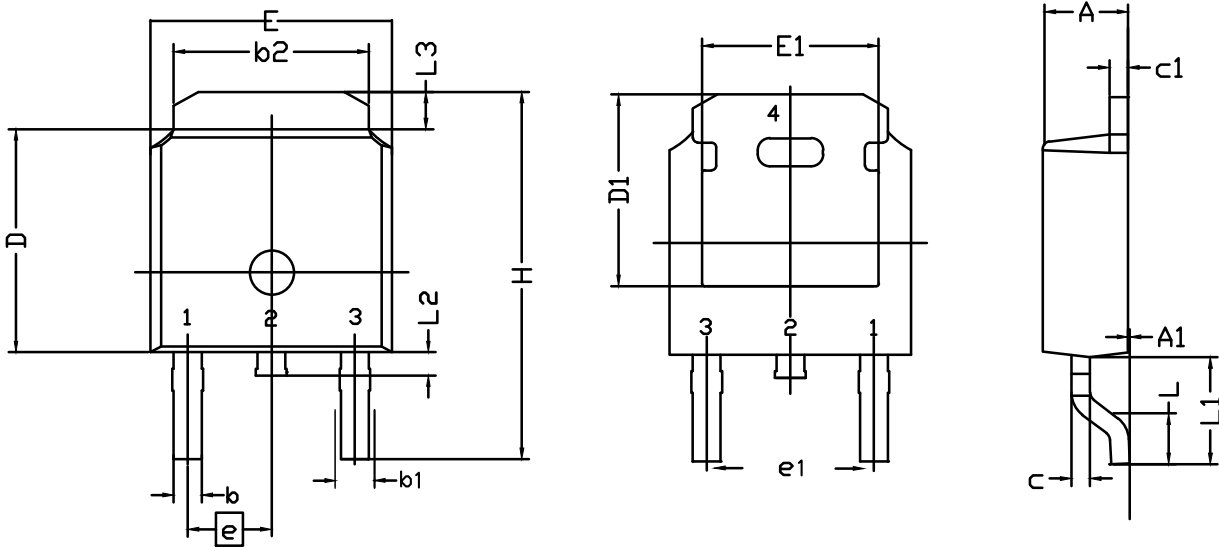


**Figure 7. Gate Charge**



**Figure 8. Maximum Safe Operating Area**

**TO-252 Package Outline Dimensions**



Symbol	Dimensions (unit:mm)			Symbol	Dimensions (unit:mm)		
	Min	Typ	Max		Min	Typ	Max
<b>A</b>	2.20	2.30	2.38	<b>E</b>	6.40	6.60	6.731
<b>A<sub>1</sub></b>	0.00	0.10	0.20	<b>E<sub>1</sub></b>	4.40	--	--
<b>b</b>	0.64	0.76	0.89	<b>e</b>	2.286 BSC		
<b>b<sub>1</sub></b>	0.77	0.85	1.14	<b>e<sub>1</sub></b>	4.572 BSC		
<b>b<sub>2</sub></b>	5.00	5.33	5.46	<b>H</b>	9.40	10.00	10.40
<b>c</b>	0.458	0.508	0.610	<b>L</b>	1.40	1.52	1.77
<b>C<sub>1</sub></b>	0.458	0.508	0.620	<b>L<sub>1</sub></b>	--	2.743	--
<b>D</b>	5.98	6.10	6.223	<b>L<sub>2</sub></b>	0.60	0.80	1.01
<b>D<sub>1</sub></b>	5.20	5.25	5.38	<b>L<sub>3</sub></b>	0.90	1.06	1.25