

## Features

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

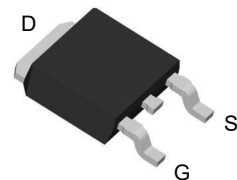
## Product Summary



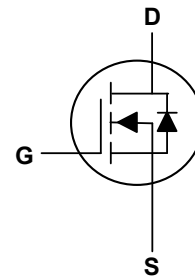
$V_{DS}$	200	V
$I_D$	9	A
$R_{DS(ON)}$ (at $V_{GS}=10V$ )	290	m $\Omega$

## Applications

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



TO-252 Top View



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

Parameter	Symbol	Rating	Units
Drain-Source Voltage	$V_{DS}$	200	V
Gate-Source Voltage	$V_{GS}$	$\pm 30$	V
Continuous Drain Current <sup>1</sup>	$I_D$	9	A
Pulsed Drain Current <sup>2</sup>	$I_{DM}$	36	A
Single Pulse Avalanche Energy <sup>3</sup>	$E_{AS}$	320	mJ
Total Power Dissipation <sup>4</sup>	$P_D$	74	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>	$R_{\theta JA}$	---	60	$^{\circ}C/W$
Thermal Resistance Junction-Case <sup>1</sup>	$R_{\theta JC}$	---	1.7	$^{\circ}C/W$

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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V$ , $I_D=250\mu A$	200	---	---	V
Static Drain-Source On-Resistance <sup>2</sup>	$R_{DS(ON)}$	$V_{GS}=10V$ , $I_D=4.5A$	---	250	290	$m\Omega$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}$ , $I_D=250\mu A$	2	---	4	V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=200V$ , $V_{GS}=0V$ , $T_J=25^{\circ}\text{C}$	---	---	1	$\mu A$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 30V$ , $V_{DS}=0V$	---	---	$\pm 100$	nA
Total Gate Charge	$Q_g$	$V_{DS}=160V$ , $V_{GS}=10V$ , $I_D=5.9A$	---	19	---	nC
Gate-Source Charge	$Q_{gs}$		---	3	---	
Gate-Drain Charge	$Q_{gd}$		---	5	---	
Turn-On Delay Time	$T_{d(on)}$	$V_{DD}=100V$ , $V_{GS}=10V$ , $R_G=50\Omega$ , $I_D=5A$	---	24	---	ns
Rise Time	$T_r$		---	15	---	
Turn-Off Delay Time	$T_{d(off)}$		---	115	---	
Fall Time	$T_f$		---	25	---	
Input Capacitance	$C_{iss}$	$V_{DS}=25V$ , $V_{GS}=0V$ , $f=1\text{MHz}$	---	920	---	pF
Output Capacitance	$C_{oss}$		---	125	---	
Reverse Transfer Capacitance	$C_{rss}$		---	25	---	

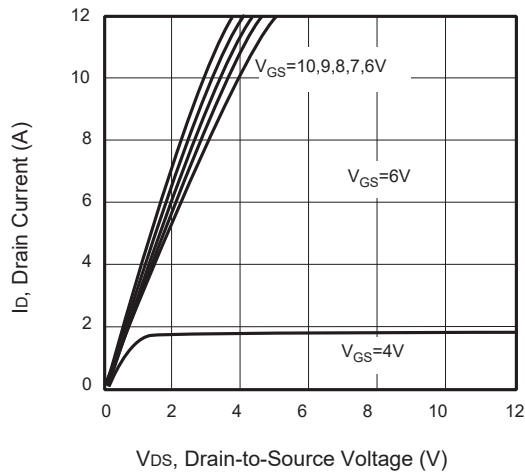
**Drain-Source Diode Characteristics**

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Diode Forward Voltage <sup>2</sup>	$V_{SD}$	$V_{GS}=0V$ , $I_S=9A$ , $T_J=25^{\circ}\text{C}$	---	---	1.4	V
Reverse Recovery Time	$t_{rr}$	$I_F=9A$ , $V_{GS}=0V$ $di/dt=100A/\mu s$ , $T_J=25^{\circ}\text{C}$	---	190	---	nS
Reverse Recovery Charge	$Q_{rr}$		---	1.7	---	nC

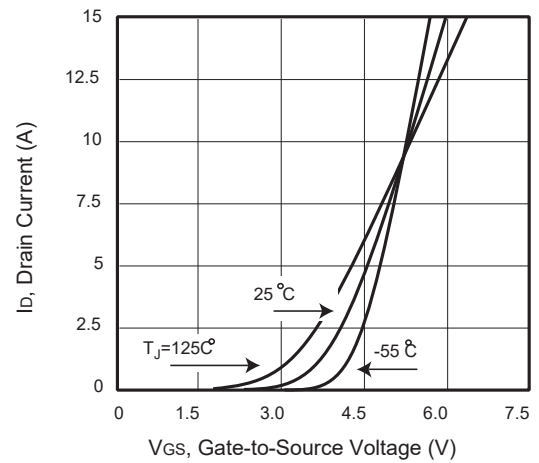
**Note:**

1. The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 20Z 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  $V_{DD}=50V$ ,  $V_{GS}=10V$ ,  $L=10mH$
4. The power dissipation is limited by  $150^{\circ}\text{C}$  junction temperature

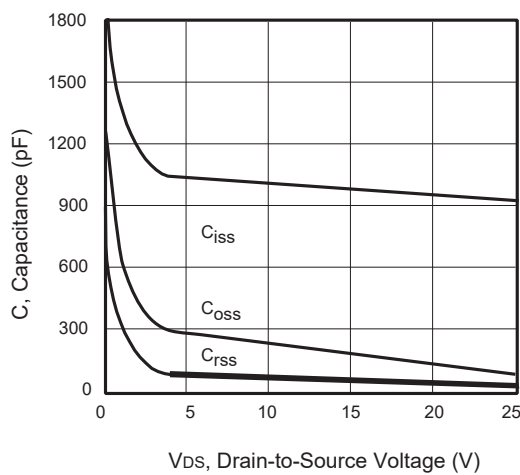
## Typical Characteristics



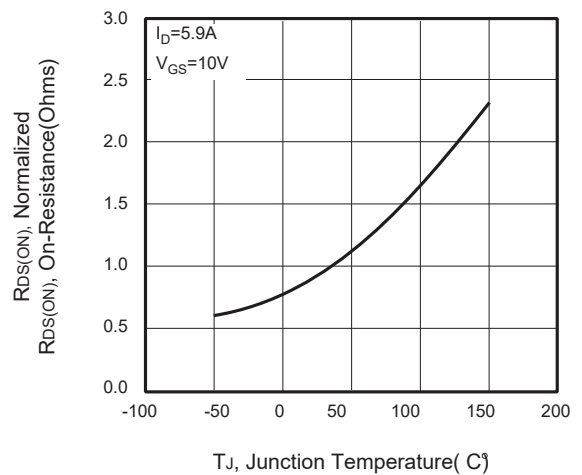
**Figure1. Output Characteristics**



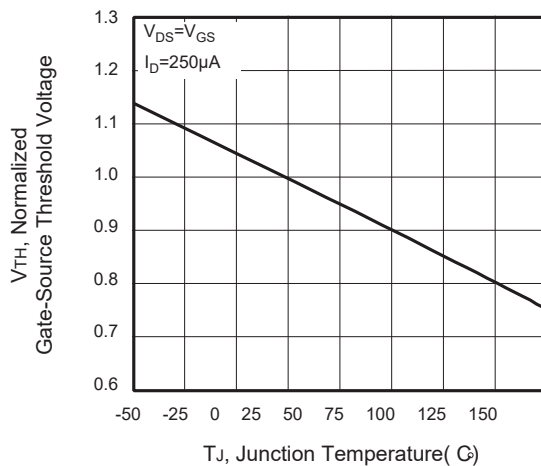
**Figure 2. Transfer Characteristics**



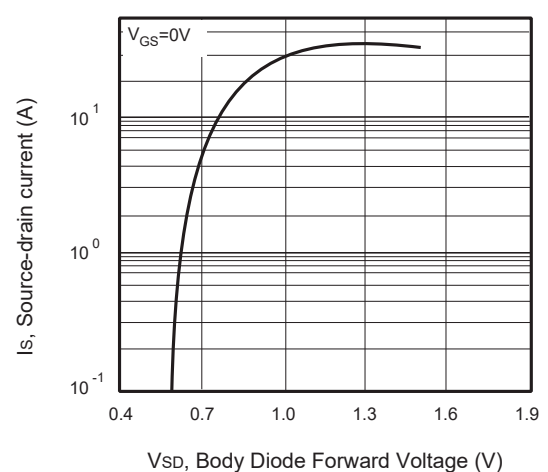
**Figure 3. Capacitance**



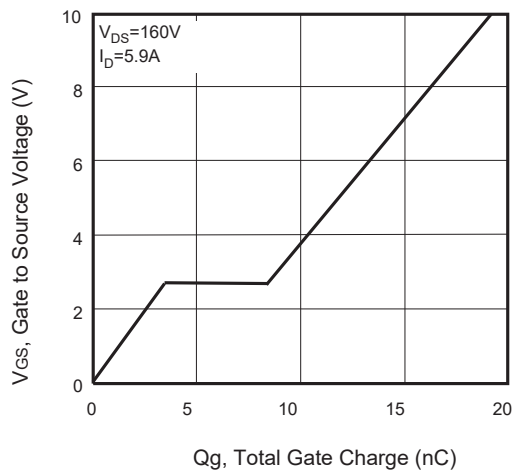
**Figure 4. On-Resistance Variation with Temperature**



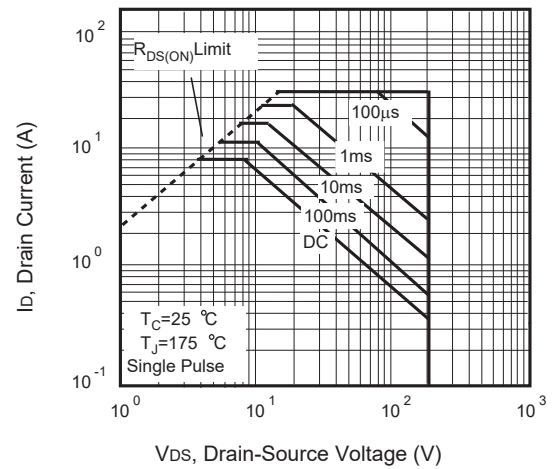
**Figure 5. Gate Threshold Variation with Temperature**



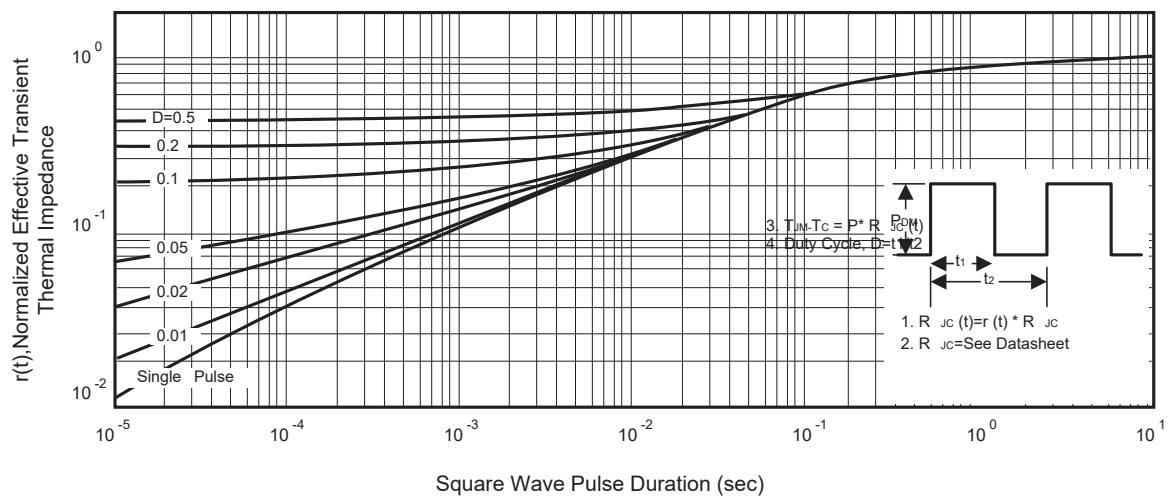
**Figure 6. Body Diode Forward Voltage Variation with Source Current**



**Figure 7. Gate Charge**

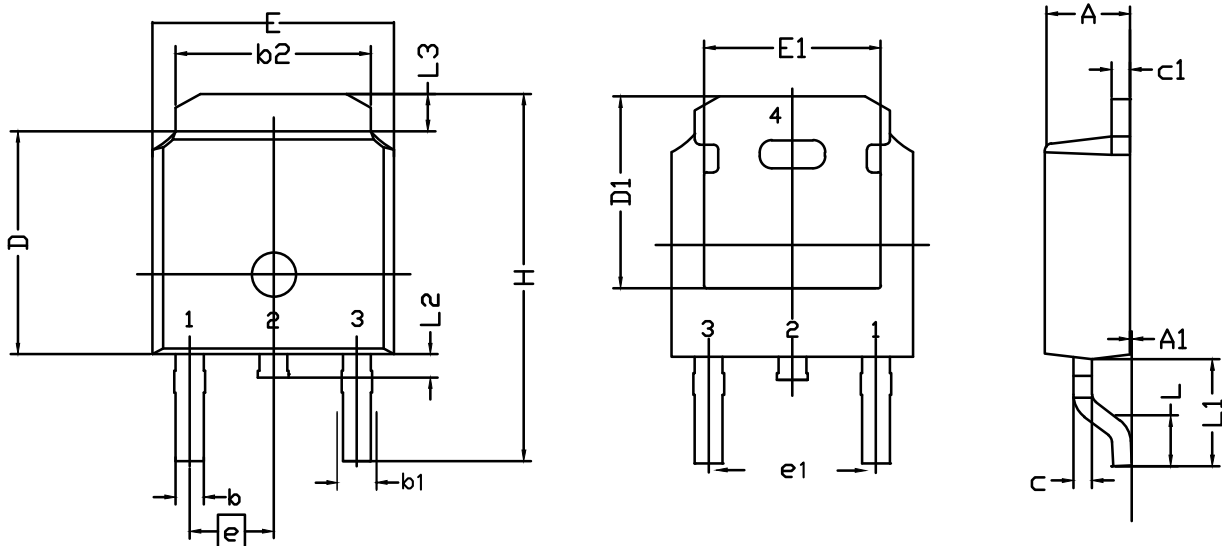


**Figure 8. Maximum Safe Operating Area**



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

**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