

**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
- Power Tool Application

**Product Summary**



$V_{DS}$	-40	V
$I_D$	-107	A
$R_{DS(ON)}$ (at $V_{GS}=-10V$ )	3.8	m $\Omega$



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

Parameter	Symbol	Rating	Units
Drain-Source Voltage	$V_{DS}$	-40	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current <sup>1</sup>	$I_D@T_C=25^{\circ}C$	-107	A
Continuous Drain Current <sup>1</sup>	$I_D@T_C=100^{\circ}C$	-85	A
Pulsed Drain Current <sup>2</sup>	$I_{DM}$	-600	A
Single Pulse Avalanche Energy <sup>3</sup>	EAS	1340	mJ
Total Power Dissipation <sup>4</sup>	$P_D$	250	W
Storage Temperature Range	$T_{STG}$	-55 to 175	$^{\circ}C$
Operating Junction Temperature Range	$T_J$	-55 to 175	$^{\circ}C$

**Thermal Characteristics**

Parameter	Symbol	Typ	Max	Unit
Thermal Resistance Junction-Ambient <sup>1</sup>	$R_{\theta JA}$	---	42	$^{\circ}C/W$
Thermal Resistance Junction-Case <sup>1</sup>	$R_{\theta JC}$	---	0.6	$^{\circ}C/W$

**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	-40	---	---	V
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =-10V, I <sub>D</sub> =-20A	---	2.9	3.8	mΩ
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-20A	---	4.5	6.0	mΩ
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =-250uA	-1.0	---	-2.5	V
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =-40V, V <sub>GS</sub> =0V	---	---	-1	uA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	---	---	±100	nA
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =-20V, V <sub>GS</sub> =-10V, I <sub>D</sub> =-75A	---	100	---	nC
Gate-Source Charge	Q <sub>gs</sub>		---	21	---	
Gate-Drain Charge	Q <sub>gd</sub>		---	15	---	
Turn-On Delay Time	T <sub>d(on)</sub>	V <sub>DS</sub> =-20V, V <sub>GS</sub> =-10V, R <sub>G</sub> =1.6Ω	---	16	---	ns
Rise Time	T <sub>r</sub>		---	10	---	
Turn-Off Delay Time	T <sub>d(off)</sub>		---	85	---	
Fall Time	T <sub>f</sub>		---	10	---	
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =-20V, V <sub>GS</sub> =0V, f=1MHz	---	8900	---	pF
Output Capacitance	C <sub>oss</sub>		---	1890	---	
Reverse Transfer Capacitance	C <sub>rss</sub>		---	40	---	

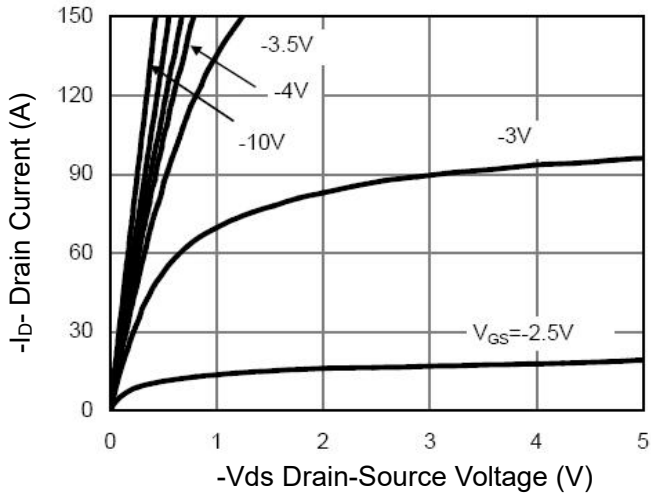
**Drain-Source Diode Characteristics**

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Continuous Source Current <sup>1</sup>	I <sub>S</sub>		---	---	-107	A
Diode Forward Voltage <sup>2</sup>	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =-75A	---	---	-1.2	V
Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> =-75A, di/dt=100A/μs	---	35	---	nS
Reverse Recovery Charge	Q <sub>rr</sub>		---	85	---	nC

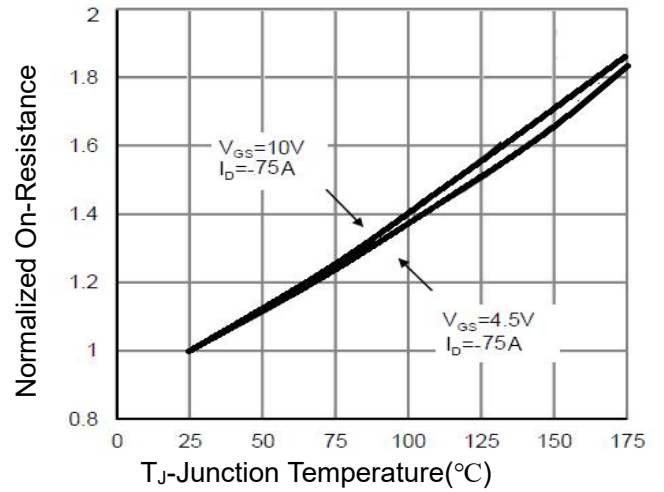
**Note:**

- 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>=20V, V<sub>GS</sub>=10V, L=0.5mH
- 4.The power dissipation is limited by 150°C junction temperature
- 5.The data is theoretically the same as I<sub>D</sub> and I<sub>DM</sub>, in real applications, should be limited by total power dissipation.

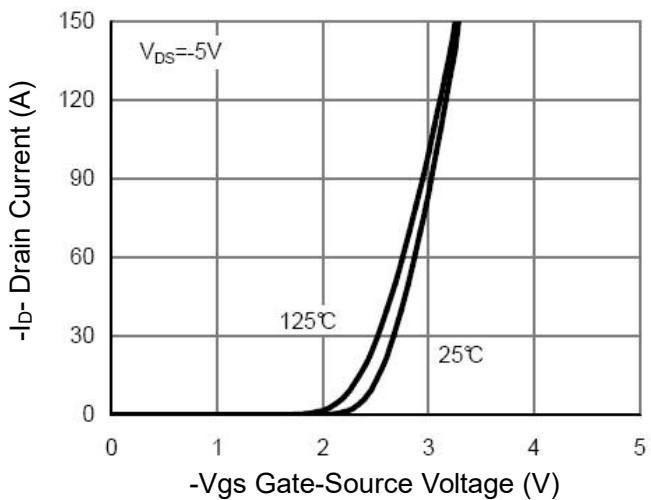
**Typical Characteristics**



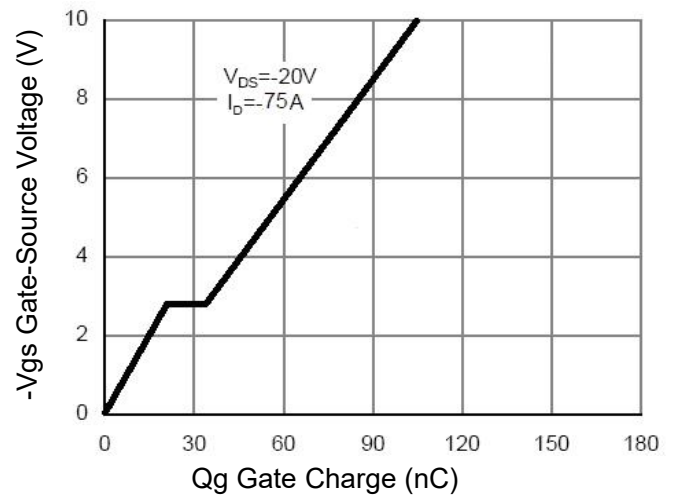
**Figure 1 Output Characteristics**



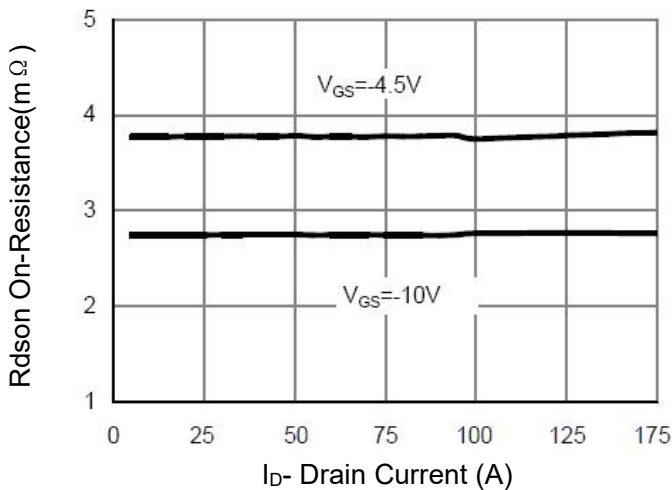
**Figure 4 R\_DS(on)-Junction Temperature**



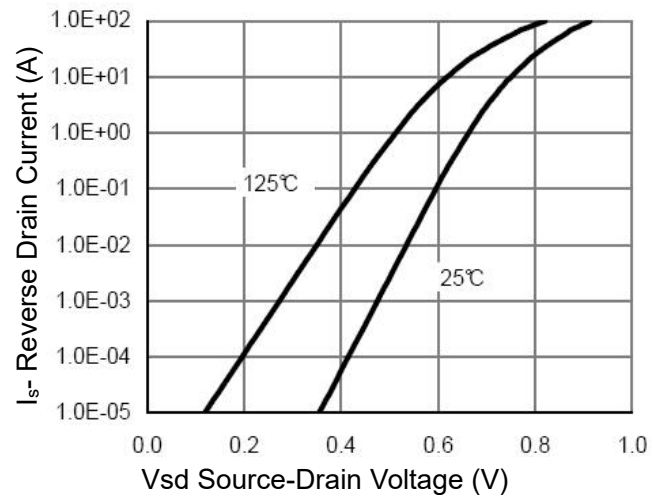
**Figure 2 Transfer Characteristics**



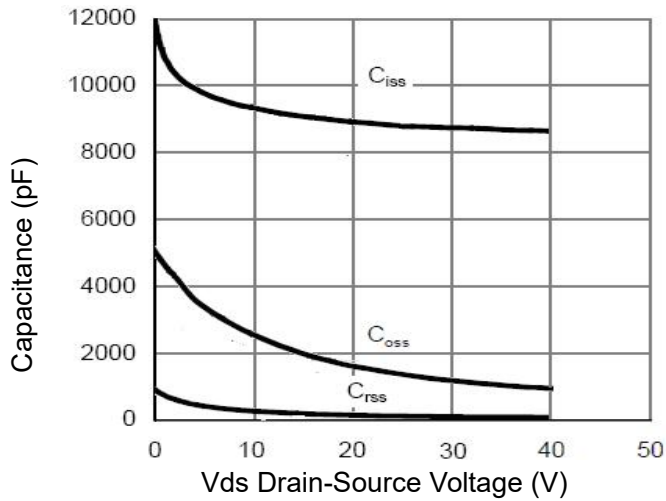
**Figure 5 Gate Charge**



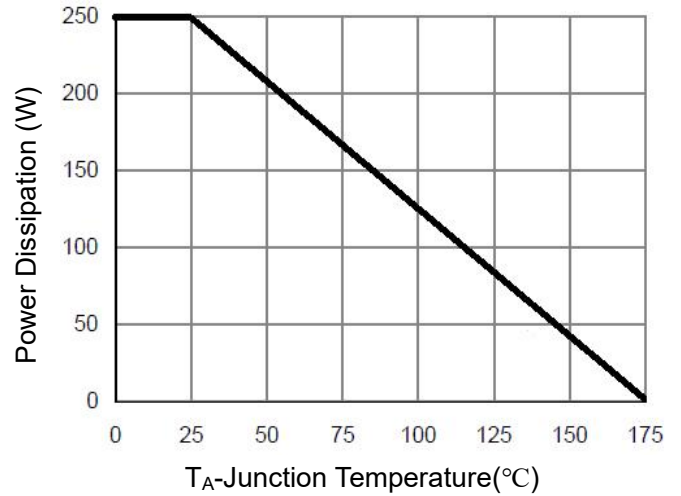
**Figure 3 R\_DS(on)- Drain Current**



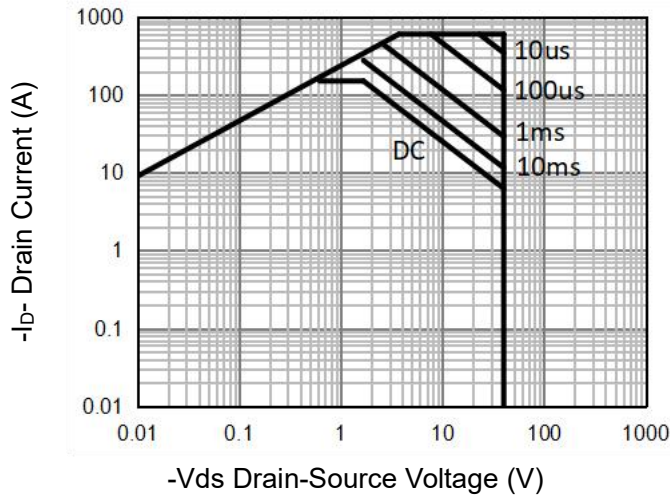
**Figure 6 Source- Drain Diode Forward**



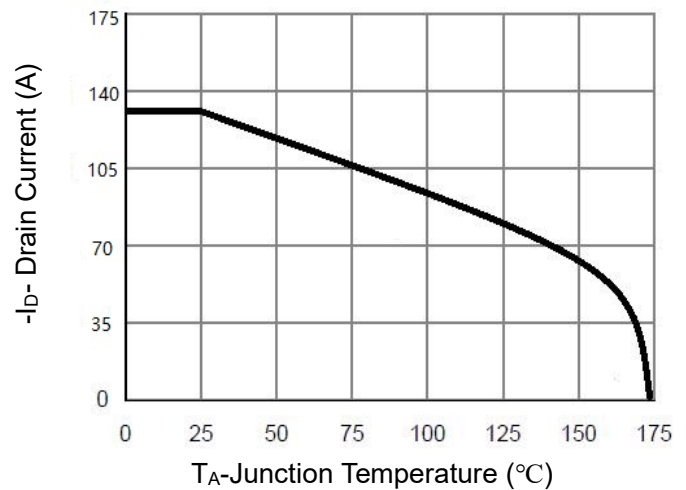
**Figure 7 Capacitance vs Vds**



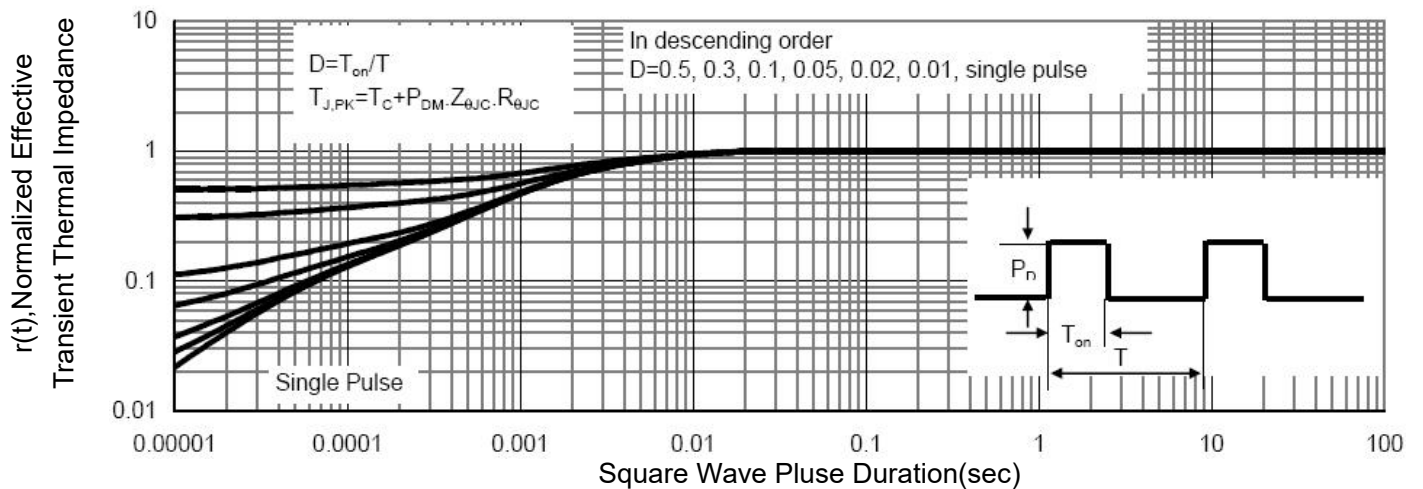
**Figure 9 Power De-rating**



**Figure 8 Safe Operation Area** (Note 3)

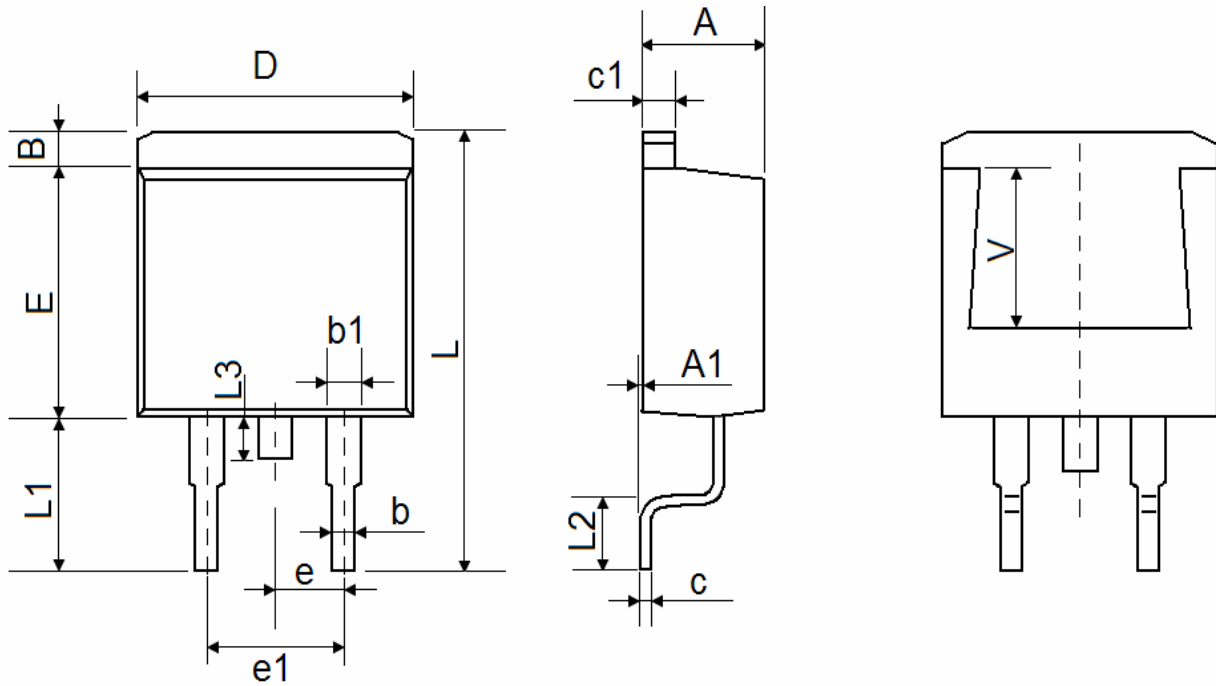


**Figure 10 Current De-rating**



**Figure 11 Normalized Maximum Transient Thermal Impedance**

**TO-263 Package Outline Dimensions**



Symbol	Dimensions (unit:mm)			Symbol	Dimensions (unit:mm)		
	Min	Typ	Max		Min	Typ	Max
<b>A</b>	4.40	4.55	4.70	<b>A1</b>	0.00	0.07	0.15
<b>B</b>	1.00	1.20	1.40	<b>b</b>	0.65	0.80	0.95
<b>b1</b>	1.10	1.15	1.37	<b>c</b>	0.30	0.40	0.53
<b>c1</b>	1.10	1.25	1.37	<b>D</b>	9.80	10.00	10.40
<b>E</b>	8.50	8.80	9.20	<b>e</b>	2.54 REF		
<b>e1</b>	4.90	5.10	5.40	<b>L</b>	14.80	15.20	15.70
<b>L1</b>	5.00	5.25	5.60	<b>L2</b>	2.05	2.45	2.80
<b>L3</b>	1.20	1.50	1.80	<b>V</b>	5.60 REF		

## Printing Information

ATC           =====Brand

XXXXXXXX       =====Material Code

XXYY           =====XX Representative Year  
                  YY Representative Weeks