

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D$
-40V	3.4mΩ@-10V	-150A
	4.6mΩ@-4.5V	

## Feature

- High density cell design for low Rdson
- Excellent package for good heat dissipation

## Application

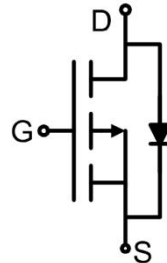
- DC-DC Converters
- Ideal for high-frequency switching and synchronous rectification

## Package

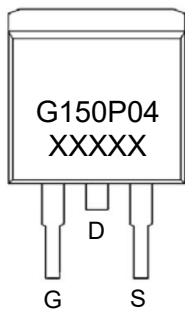


TO-263AB

## Circuit diagram



## Marking



### Absolute maximum ratings (T<sub>c</sub>=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DS</sub>	-40	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Continuous Drain Current	I <sub>D</sub>	-150	A
Continuous Drain Current (100°C)	I <sub>D</sub> (100°C)	-120	A
Pulsed Drain Current	I <sub>DM</sub>	-600	A
Power Dissipation	P <sub>D</sub>	250	W
Thermal Resistance from Junction to Case	R <sub>θJC</sub>	0.6	°C/W
Single pulse avalanche energy	E <sub>AS</sub>	1345	mJ
Junction Temperature	T <sub>J</sub>	150	°C
Storage Temperature	T <sub>STG</sub>	-55 ~ +150	°C

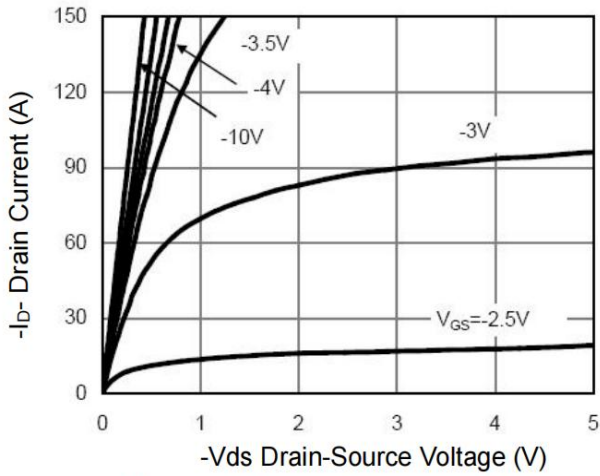
### Electrical characteristics (T<sub>c</sub>=25 °C, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA	-40			V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> = -40V, V <sub>GS</sub> = 0V			-1	μA
Gate-body leakage current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V			±100	nA
Gate threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA	-1.0	-1.6	-2.5	V
Drain-source on-resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> = -10V, I <sub>D</sub> = -75A		2.8	3.4	mΩ
		V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -75A		3.8	4.6	
<b>Dynamic characteristics<sup>2)</sup></b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = -20V, V <sub>GS</sub> = 0V, f = 1MHz		8940		pF
Output Capacitance	C <sub>oss</sub>			1900		
Reverse Transfer Capacitance	C <sub>rss</sub>			45		
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = -20V, V <sub>GS</sub> = -10V, I <sub>D</sub> = -75A		104.4		nC
Gate-Source Charge	Q <sub>gs</sub>			20.8		
Gate-Drain Charge	Q <sub>gd</sub>			13.5		
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> = -20V, V <sub>GS</sub> = -10V I <sub>D</sub> = -75A, R <sub>GEN</sub> = 1.6Ω		18		nS
Turn-on rise time	t <sub>r</sub>			13		
Turn-off delay time	t <sub>d(off)</sub>			90		
Turn-off fall time	t <sub>f</sub>			15		
<b>Source-Drain Diode characteristics</b>						
Diode Forward Current	I <sub>S</sub>				-150	A
Diode Forward voltage	V <sub>DS</sub>	V <sub>GS</sub> = 0V, I <sub>S</sub> = -75A			-1.2	V
Reverse Recovery Time	t <sub>rr</sub>	T <sub>J</sub> = 25°C, I <sub>F</sub> = -75A		35		nS
Reverse Recovery Charge	Q <sub>rr</sub>	di/dt = 100A/μs <sup>1)</sup>		85		nC

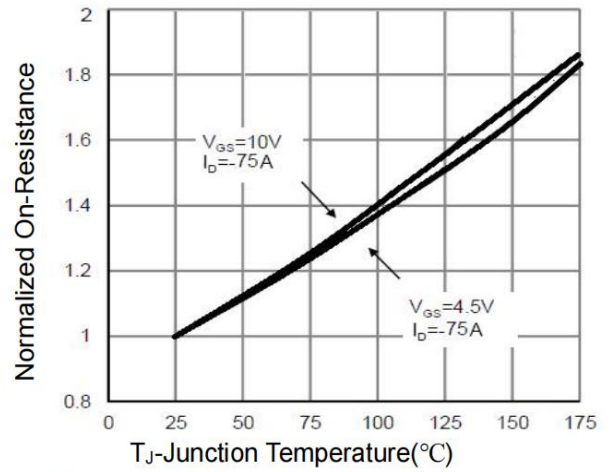
Notes:

- 1) Pulse Test: Pulse Width < 300μs, Duty Cycle ≤2%.
- 2) Guaranteed by design, not subject to production testing.

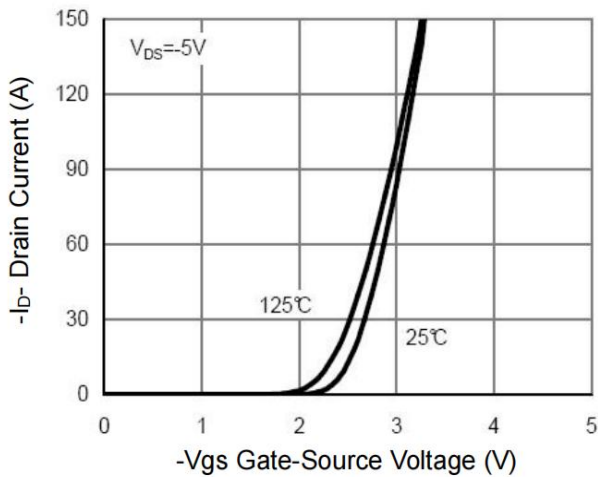
## Typical Characteristics



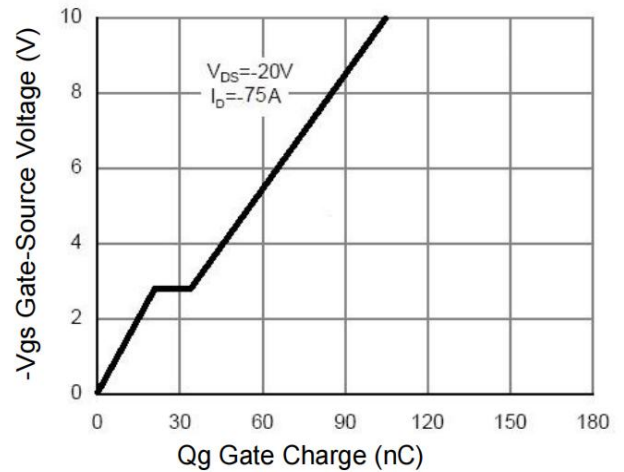
**Figure 1 Output Characteristics**



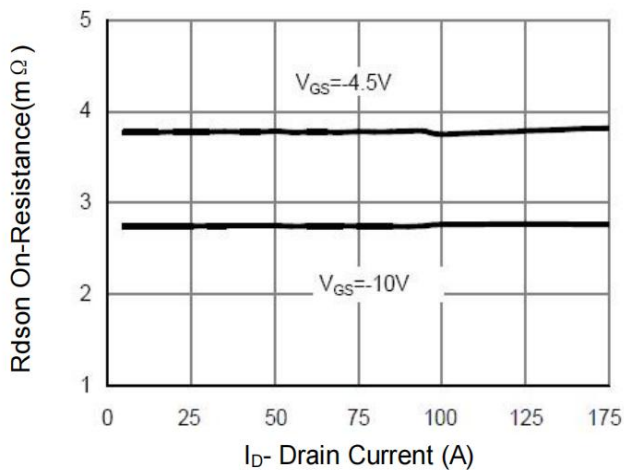
**Figure 2 Rdson-Junction Temperature**



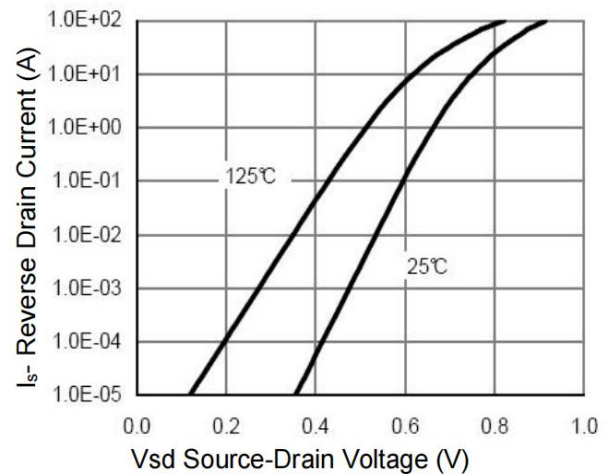
**Figure 3 Transfer Characteristics**



**Figure 4 Gate Charge**

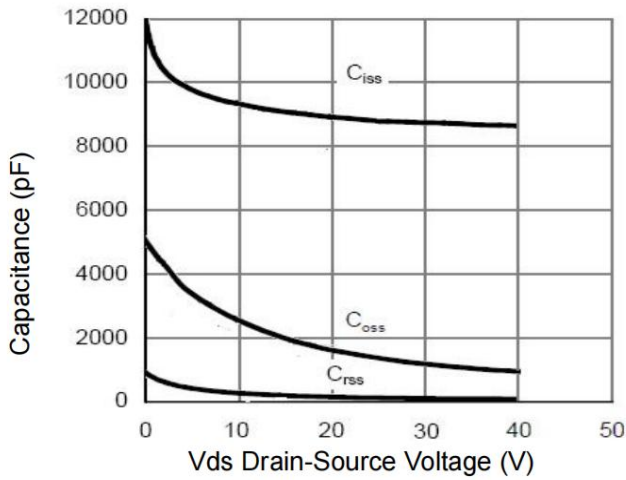


**Figure 5 Rdson- Drain Current**

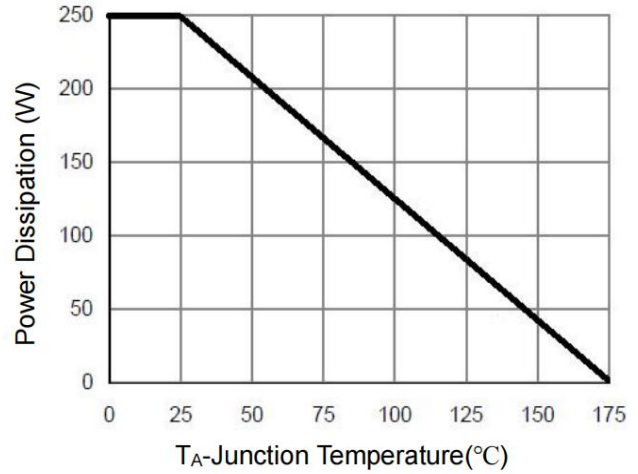


**Figure 6 Source- Drain Diode Forward**

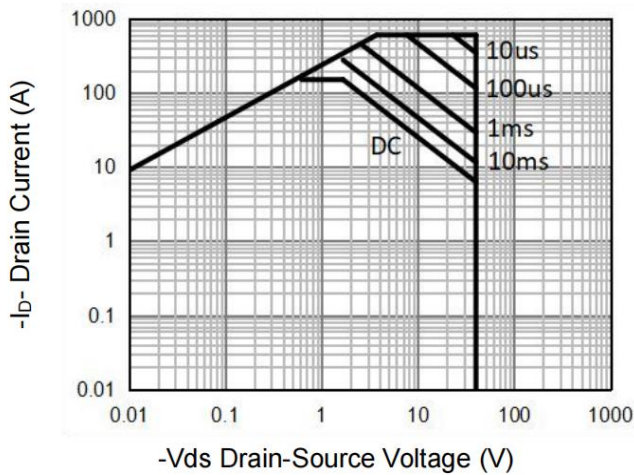
## Typical Characteristics



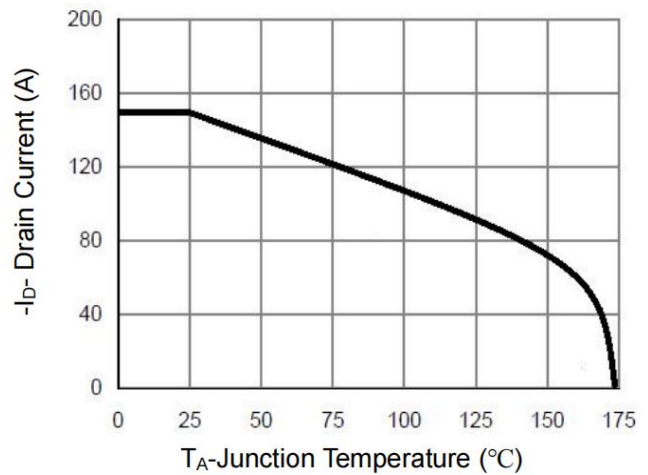
**Figure 7 Capacitance vs Vds**



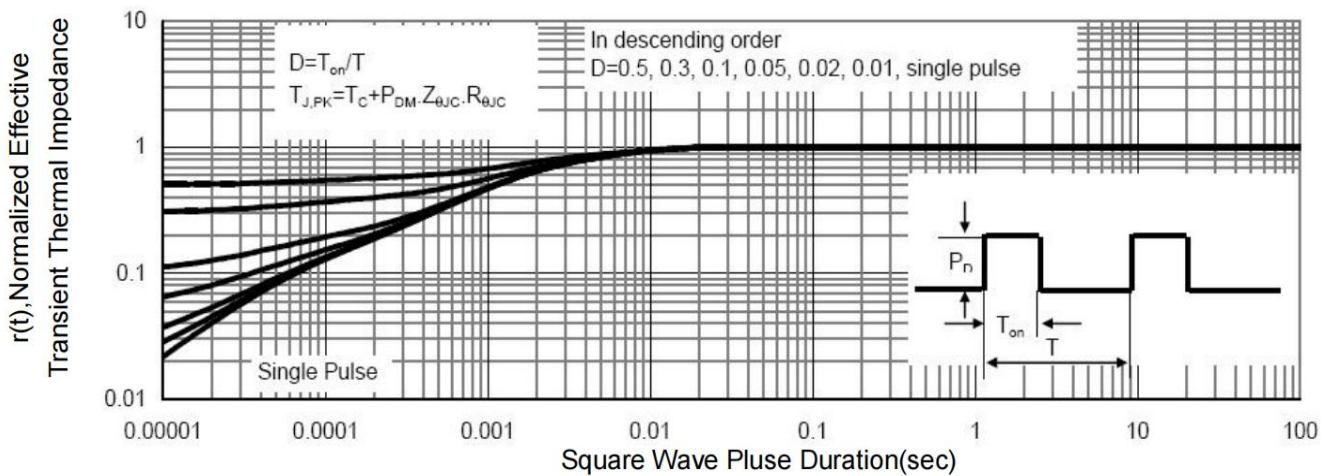
**Figure 8 Power De-rating**



**Figure 9 Safe Operation Area** (Note 3)

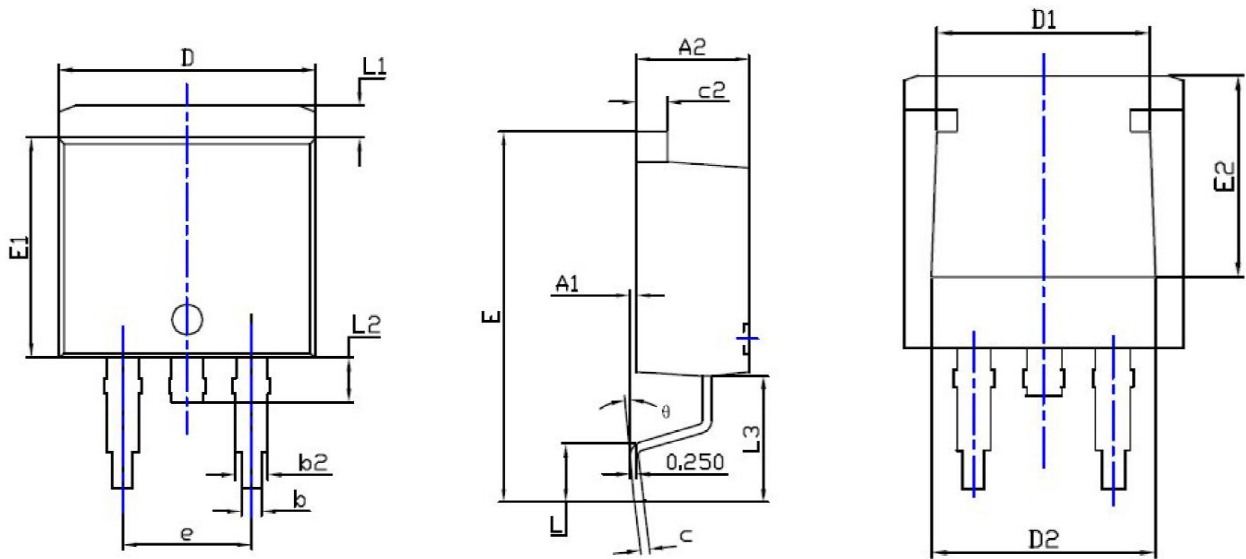


**Figure 10 Current De-rating**



**Figure 11 Normalized Maximum Transient Thermal Impedance**

### TO-263AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A1	0.000	0.250	0.000	0.010
A2	4.240	4.750	0.167	0.187
b	0.700	0.920	0.028	0.036
b2	1.180	1.750	0.046	0.069
c	0.330	0.600	0.013	0.024
c2	1.150	1.400	0.045	0.055
D	9.950	10.360	0.392	0.408
D1	6.890	8.100	0.271	0.319
D2	6.890	8.300	0.271	0.327
E	14.500	15.880	0.571	0.625
E1	8.550	9.020	0.337	0.355
E2	6.860	-	0.270	-
e	5.080 BSC		0.200 BSC	
L	1.780	2.790	0.070	0.110
L1	1.120	1.500	0.044	0.059
L2	0.770	1.770	0.030	0.070
L3	5.000 REF		0.197 REF	
θ	0°	8°	0°	8°