AG150P04S-Q1

P-Channel Super Trench Power MOSFET

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
- Suffix "-Q1" for AEC-Q101

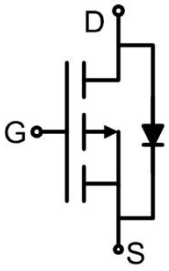
Application

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

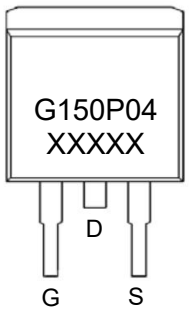
Package

TO-263AB

Circuit diagram



Marking



Absolute maximum ratings (T_C=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-40	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	-150	A
Continuous Drain Current（100℃）	I_D（100℃）	-120	A
Pulsed Drain Current	I_{DM}	-600	A
Power Dissipation	P_D	250	W
Thermal Resistance from Junction to Case	$R_{\theta JC}$	0.6	℃/W
Single pulse avalanche energy	E_{AS}	1345	mJ
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55 ~ +150	℃

Electrical characteristics (T_C=25 °C, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =-250μA	-40			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =-40V,V_{GS} = 0V			-1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±20V, V_{DS} = 0V			±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =-250μA	-1.0	-1.6	-2.5	V
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} =-10V, I_D =-75A		2.8	3.4	mΩ
		V_{GS} =-4.5V, I_D =-75A		3.8	4.6	
Dynamic characteristics[2]						
Input Capacitance	C_{iss}	V_{DS} =-20V,V_{GS} =0V,f =1MHz		8940		pF
Output Capacitance	C_{oss}			1900		
Reverse Transfer Capacitance	C_{rss}			45		
Total Gate Charge	Q_g	V_{DS} =-20V,V_{GS} =-10V,I_D =-75A		104.4		nC
Gate-Source Charge	Q_{gs}			20.8		
Gate-Drain Charge	Q_{gd}			13.5		
Turn-on delay time	$t_{d(on)}$	V_{DD}=-20V,V_{GS}=-10V I_D =-75A, R_{GEN}=1.6Ω		18		nS
Turn-on rise time	t_r			13		
Turn-off delay time	$t_{d(off)}$			90		
Turn-off fall time	t_f			15		
Source-Drain Diode characteristics						
Diode Forward Current	I_S				-150	A
Diode Forward voltage	V_{DS}	V_{GS} =0V, I_S=-75A			-1.2	V
Reverse Recovery Time	t_{rr}	TJ = 25°C, I_F =-75A di/dt = 100A/μs [1]		35		nS
Reverse Recovery Charge	Q_{rr}			85		nC

Notes:

1) Pulse Test: Pulse Width < 300μs, Duty Cycle ≤2%.

2) Guaranteed by design, not subject to production testing.

Typical Characteristics

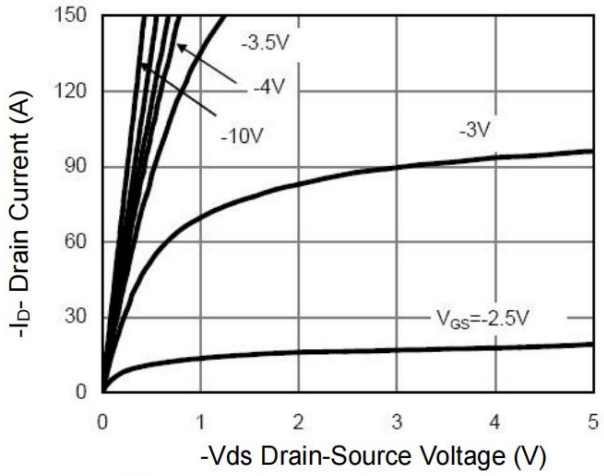


Figure 1 Output Characteristics

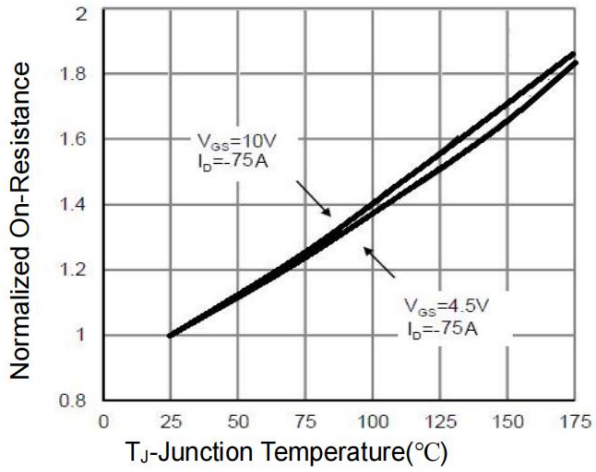


Figure 2 Rdson-JunctionTemperature

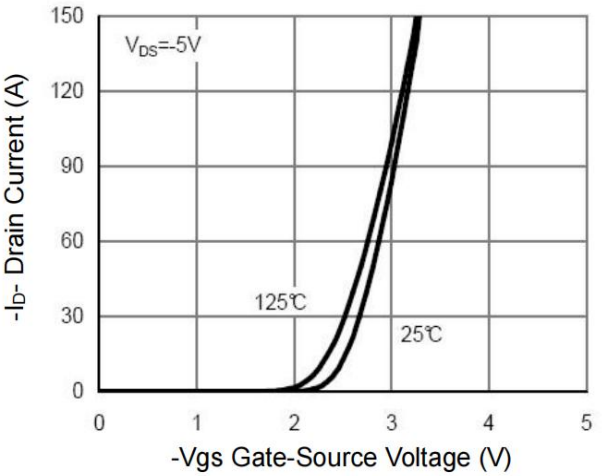


Figure 3 Transfer Characteristics

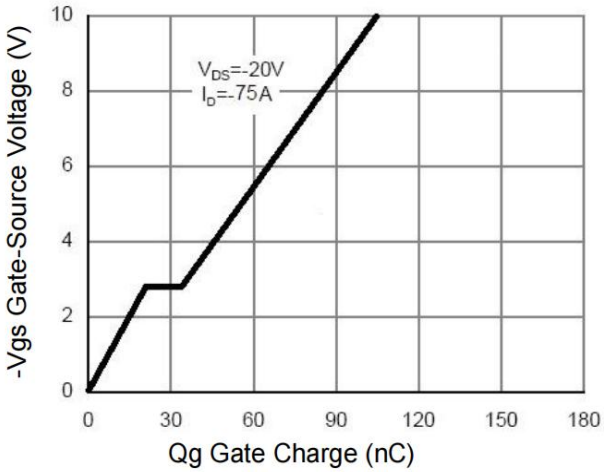


Figure 4 Gate Charge

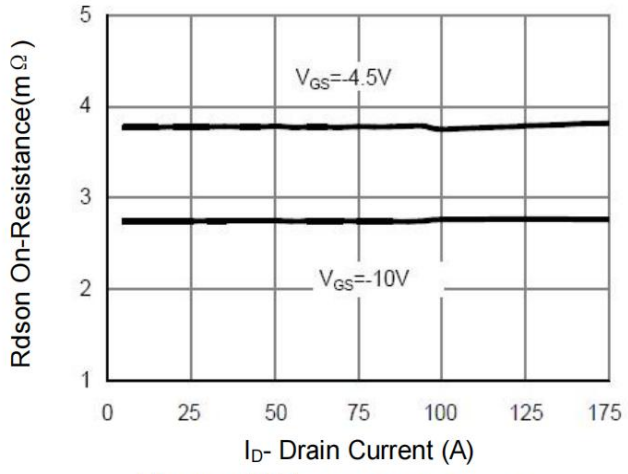


Figure 5 Rdson- Drain Current

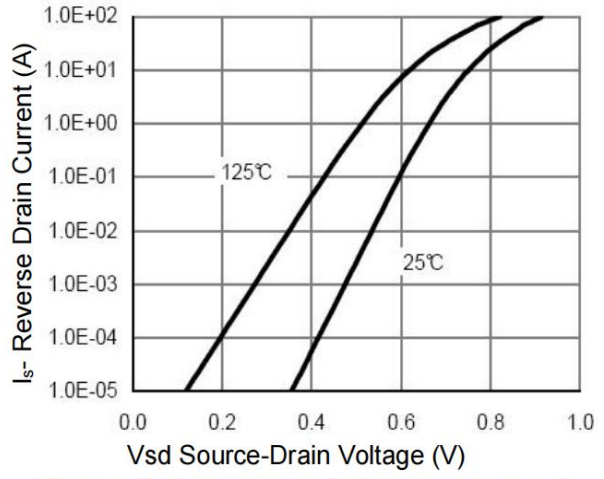


Figure 6 Source- Drain Diode Forward

Typical Characteristics

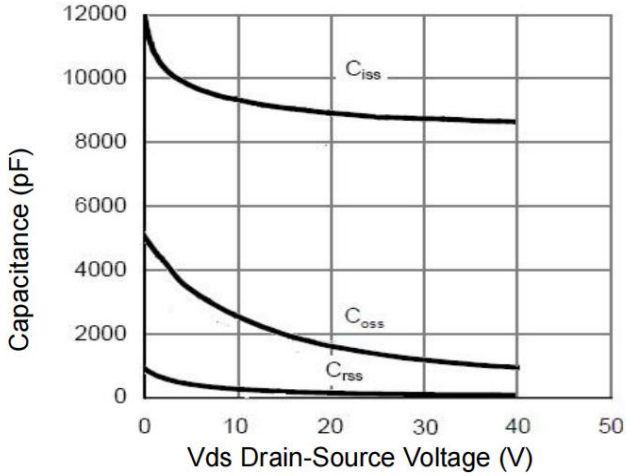


Figure 7 Capacitance vs Vds

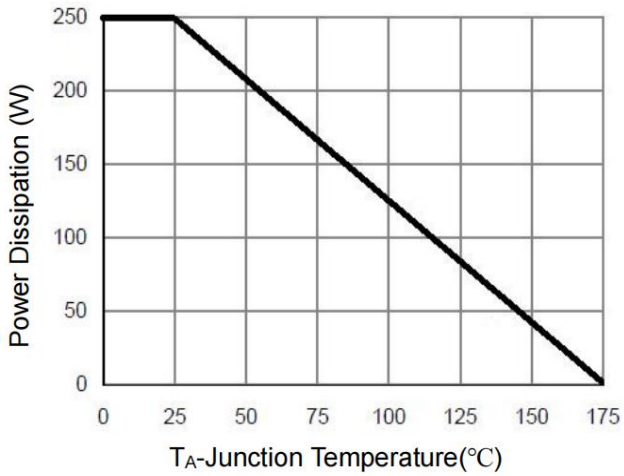


Figure 8 Power De-rating

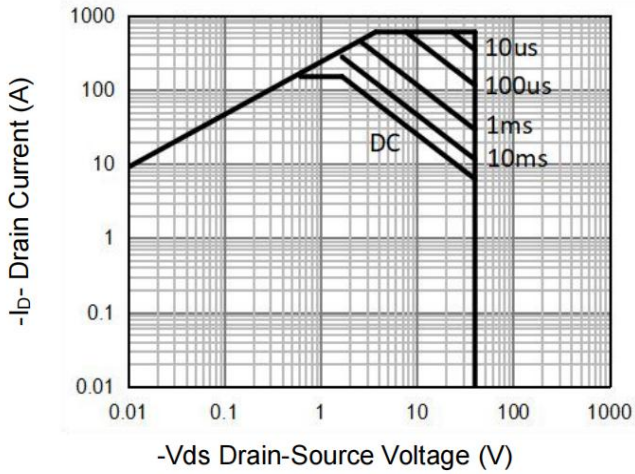


Figure 9 Safe Operation Area(Note 3)

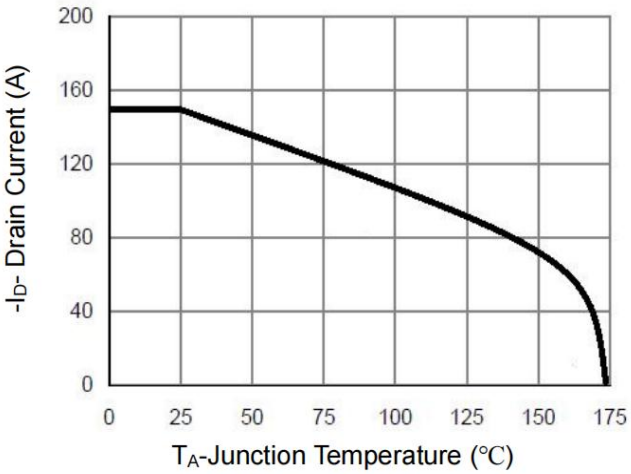


Figure 10 Current De-rating

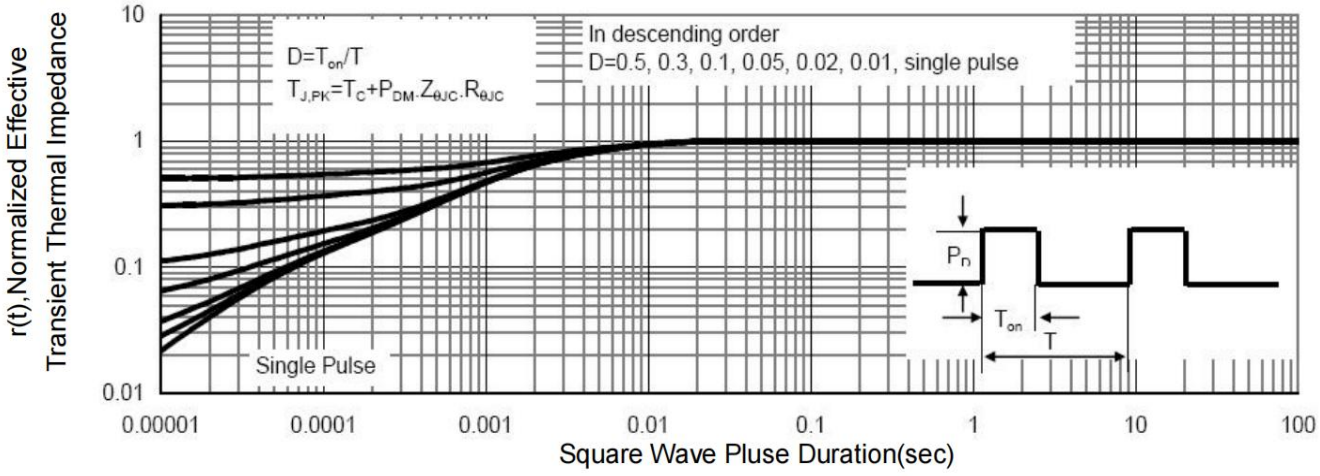
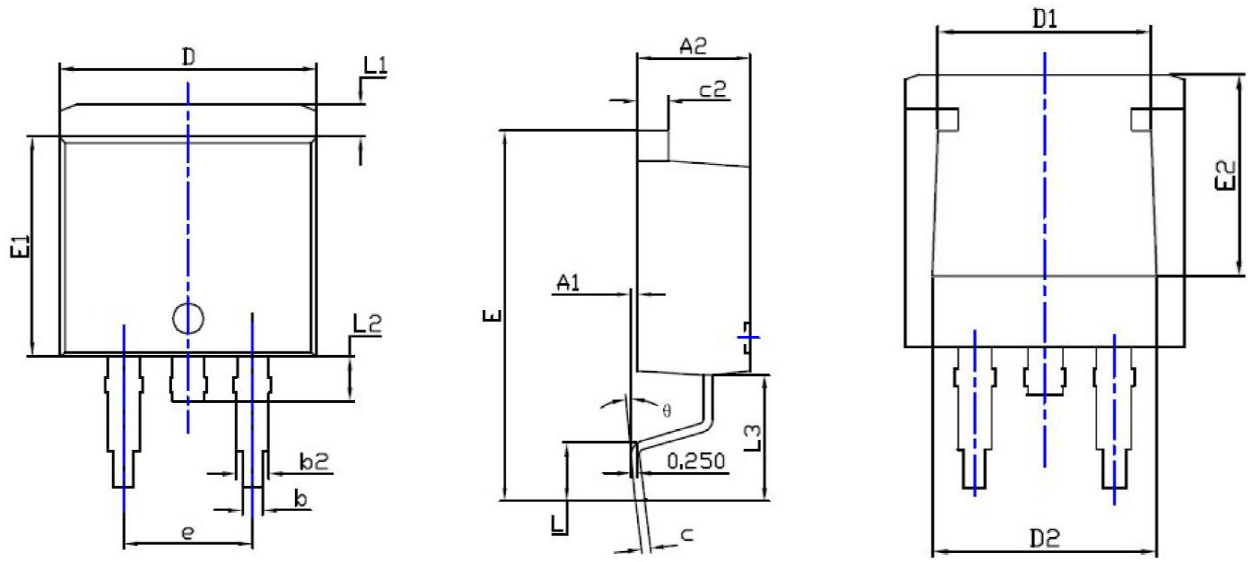


Figure 11 Normalized Maximum Transient Thermal Impedance

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°