AGR330N65ES-Q1

N-Channel Super Junction Power MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
650V	330mΩ@10V	11A

Feature

- Optimized body diode reverse recovery performance
- Low on-resistance and low conduction losses
- Ultra Low Gate Charge cause lower driving requirements
- ESD protected
- Suffix "-Q1" for AEC-Q101

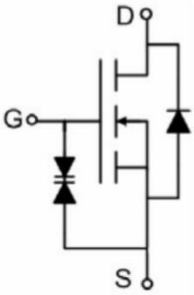
Application

- Power factor correction（PFC）
- Switched mode power supplies(SMPS)
- Uninterruptible power supply（UPS）
- LLC Half-bridge

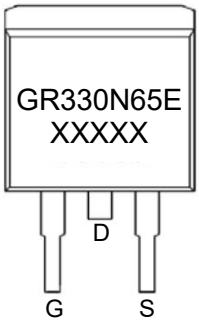
Package

TO-263AB

Circuit Diagram



Marking



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Absolute Maximum Ratings (T_C=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	650	V
Gate-Source Voltage AC(f > 1Hz)	V_{GS}	±30	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	11	A
Continuous Drain Current(T_C =100℃)	I_D(100℃)	7.7	A
Pulsed Drain Current[1)]	I_{DM}	44	A
Power Dissipation	P_D	107	W
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	1.4	℃/W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	62	℃/W
Avalanche Current[2)]	I_{AS}	3	A
Junction Temperature	T_J	175	℃
Storage Temperature	T_{STG}	-55 ~ +175	℃

Electrical Characteristics (T_A=25 ºC 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	650			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} =650V,V_{GS} = 0V,T_C=25℃			1	μA
		V_{DS} =650V,V_{GS} = 0V,T_C=125℃			100	
Gate-Body Leakage Current	I_{GSS}	V_{GS} =±20V, V_{DS} = 0V			±10	μA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	3.0	3.5	4.0	V
Drain-Source on-Resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =5.5A		300	330	mΩ
Dynamic Characteristics[3)]						
Input Capacitance	C_{iss}	V_{DS} =50V,V_{GS} =0V,f =1MHz		847		pF
Output Capacitance	C_{oss}			31		
Reverse Transfer Capacitance	C_{rss}			4		
Gate Resistance	R_g	f =1MHz, open drain		18		Ω
Total Gate Charge	Q_g	V_{DS} =480V,V_{GS} =10V, I_D =5.5A		17		nC
Gate-Source Charge	Q_{gs}			4.4		
Gate-Drain Charge	Q_{gd}			4.9		
Gate Plateau Volitage	V_{gp}			5.4		V
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=480V, V_{GS} =10V, I_D =5.5A, R_G=1.7Ω		10		nS
Turn-on Rise Time	t_r			7		
Turn-off Delay Time	$t_{d(off)}$			55		
Turn-off Fall Time	t_f			8		
Source-Drain Diode Characteristics						
Diode Forward Current	I_{SD}	T_C=25°C			11	A
Diode Forward Pulse Current	I_{SDM}				44	A
Diode Forward voltage	V_{SD}	T_J=25℃,V_{GS} =0V, I_{SD}=11A			1.2	V
Reverse Recovery Time	t_{rr}	T_J=25℃,I_F=5.5A, di/dt=100A/μs		200		nS
Reverse Recovery Charge	Q_{rr}			1.6		uC
Peak Reverse Recovery Current	I_{rrm}			16		A

Notes:

1) Repetitive Rating: Pulse width limited by maximum junction temperature.

2) T_J=25 ℃,V_{DD}=50V,V_G=10V,R_g=25Ω.

3) Guaranteed by design, not subject to production.

Typical Characteristics

Figure1. Safe operating area

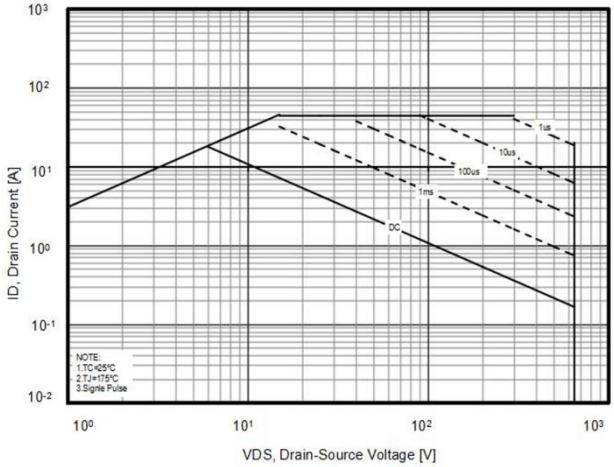


Figure2. Capacitance

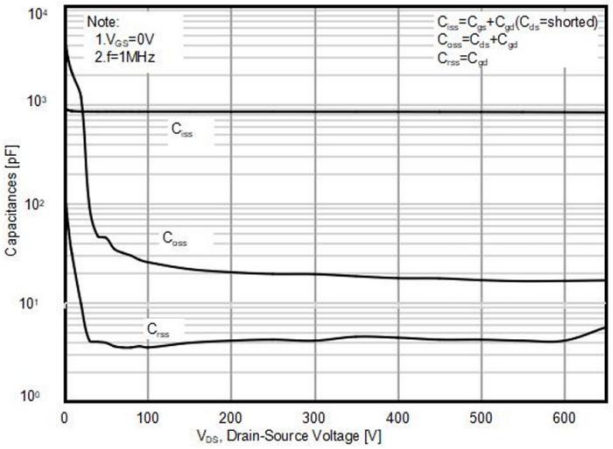


Figure3. Transfer characteristics

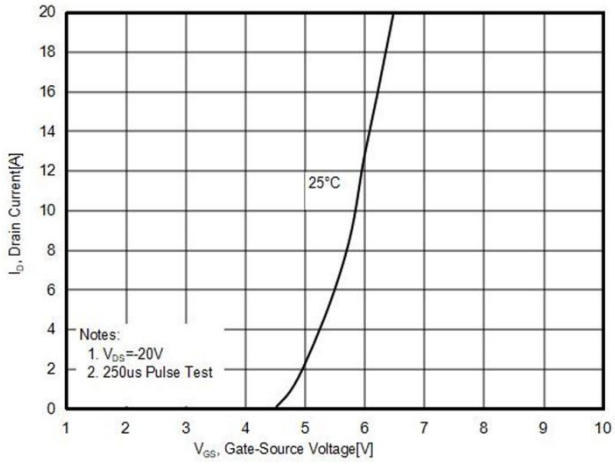


Figure4. Output characteristics

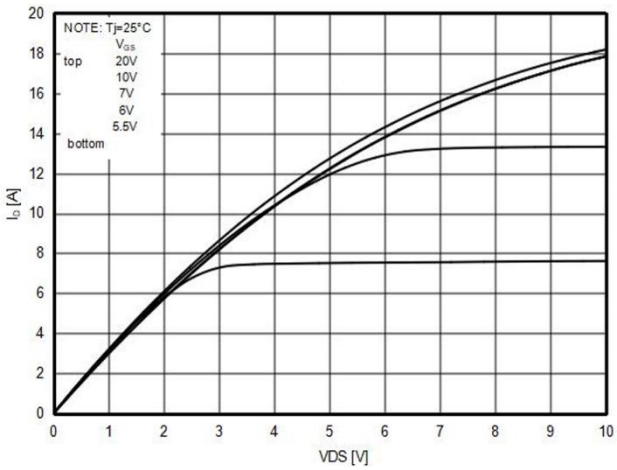


Figure5. $R_{DS(ON)}$ vs Junction Temperature

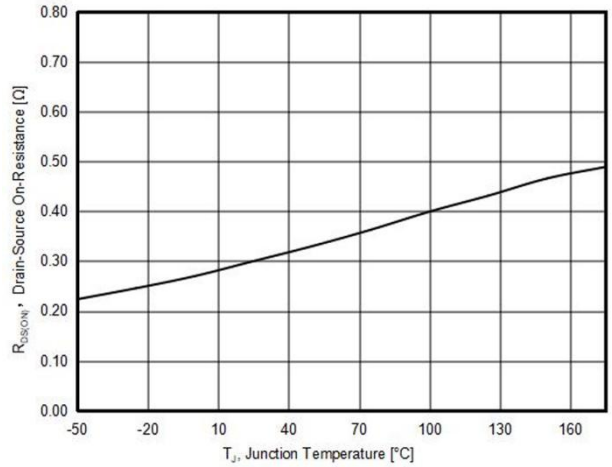
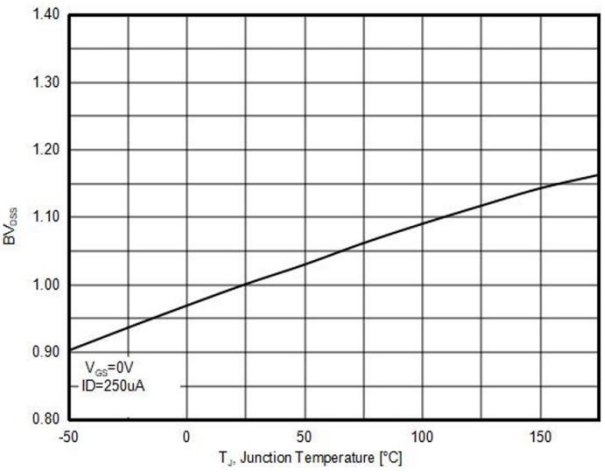


Figure6. BV_{DSS} vs Junction Temperature



Typical Characteristics

Figure7. Maximum I_D vs Junction Temperature

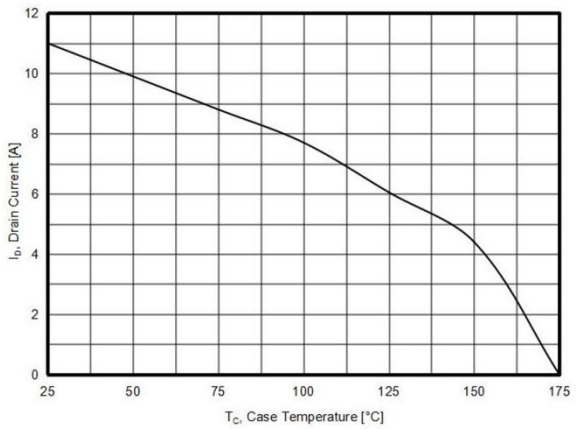


Figure8. Gate charge waveforms

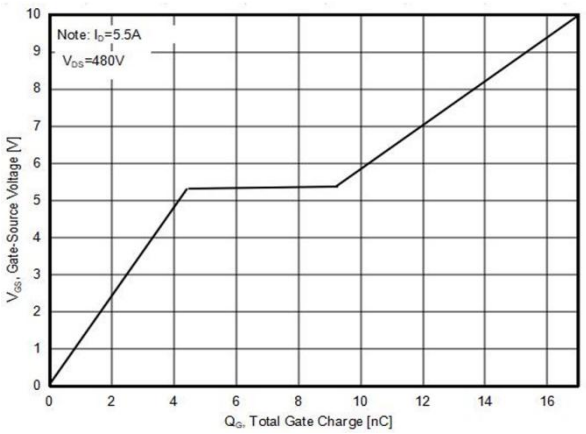


Figure9. Static drain-source on resistance

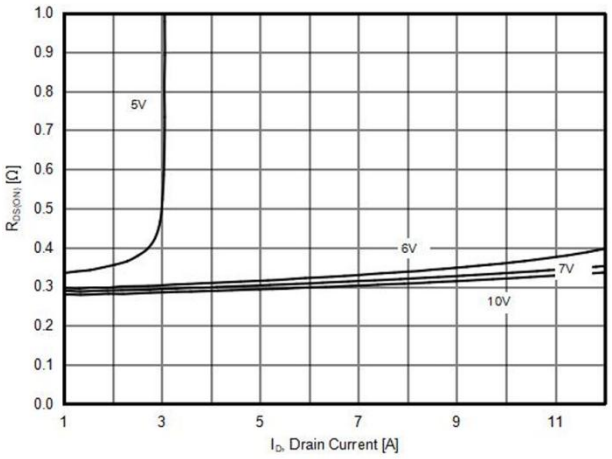
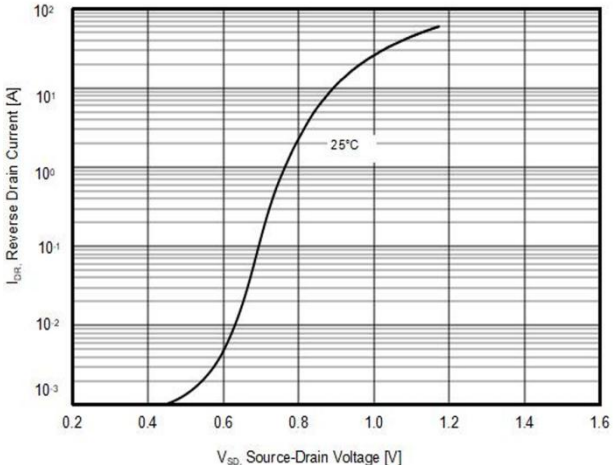
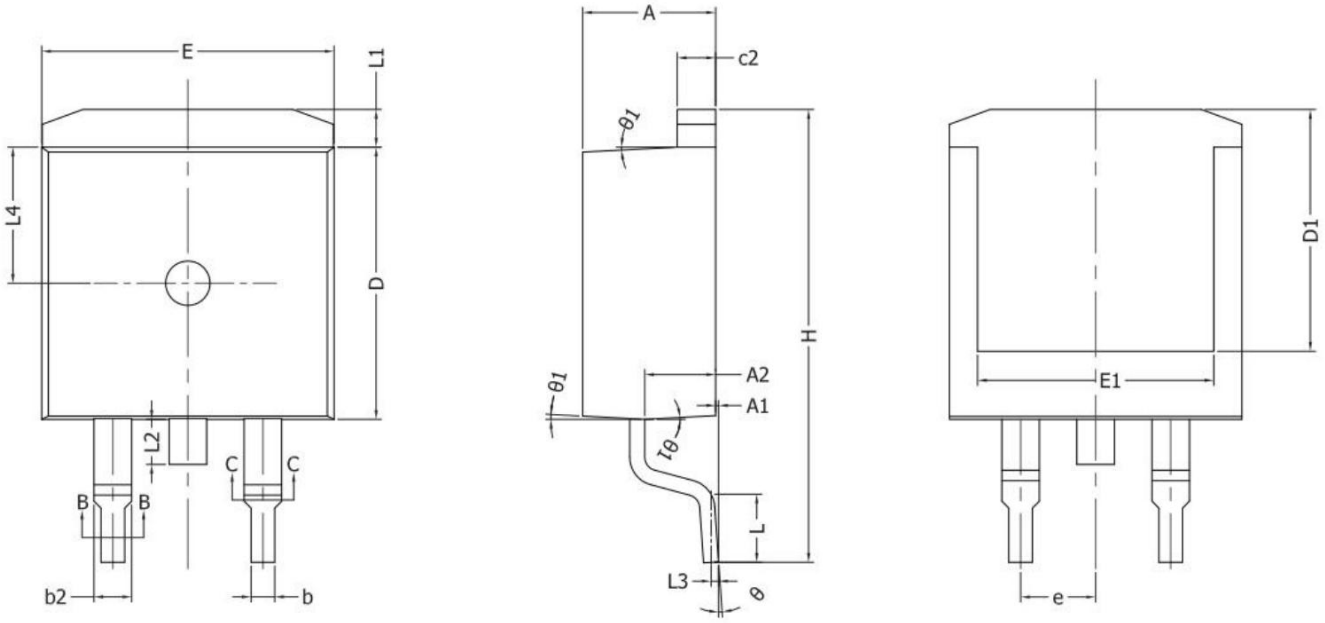


Figure10. Source-Drain Diode Forward Voltag



TO-263AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.400	4.600	0.173	0.181
A1	0.000	0.250	0.000	0.010
A2	2.200	2.600	0.087	0.102
b	0.760	0.890	0.030	0.035
b1	0.750	0.850	0.030	0.033
b2	1.230	1.370	0.048	0.054
b3	1.220	1.320	0.048	0.052
c	0.470	0.600	0.019	0.024
c1	0.460	0.560	0.018	0.022
c2	1.250	1.350	0.049	0.053
D	9.100	9.300	0.358	0.366
D1	8.000	-	0.315	-
E	9.800	10.000	0.386	0.394
E1	7.800	-	0.307	-
e	2.540BSC		0.100BSC	
H	14.900	15.700	0.587	0.618
L	2.000	2.600	0.079	0.102
L1	1.170	1.400	0.046	0.055
L2		1.750		0.069
L3	0.250REF		0.010REF	
L4	4.600REF		0.181REF	