AGR130N65S-Q1

N-Channel Super Junction Power MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
650V	130mΩ@10V	26A

Feature

- New technology for high voltage device
- Ultra low on-resistance and ultra low conduction losses
- Diode reverse recovery speed is super fast
- High reliability
- Ultra low gate charge cause lower driving requirements
- Suffix "-Q1" for AEC-Q101

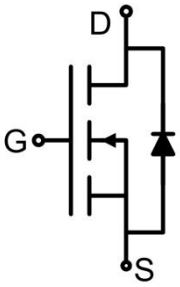
Application

- Power factor correction（PFC）
- Switched mode power supplies(SMPS)
- Uninterruptible power supply（UPS）
- On-board charger (OBS)

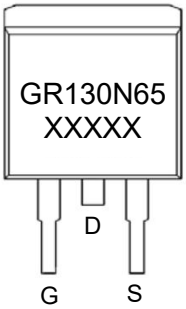
Package

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	26	A
Continuous Drain Current(T_C =100℃)	I_D(100℃)	18.2	A
Pulsed Drain Current[1]	I_{DM}	78	A
Power Dissipation	P_D	237	W
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	0.63	℃/W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	62	℃/W
Avalanche Current[2]	I_{AS}	7	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℃			10	μA
		V_{DS} =650V,V_{GS} = 0V,T_C=125℃			400	
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 =500μA	3.5	4.2	5.0	V
Drain-Source on-Resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =13A		110	130	mΩ
Dynamic Characteristics[3]						
Input Capacitance	C_{iss}	V_{DS} =50V,V_{GS} =0V,f =1MHz		2161		pF
Output Capacitance	C_{oss}			95		
Reverse Transfer Capacitance	C_{rss}			50		
Gate Resistance	R_g	f =1MHz, open drain		1.5		Ω
Total Gate Charge	Q_g	V_{DS} =480V,V_{GS} =10V, I_D =13A		41.2		nC
Gate-Source Charge	Q_{gs}			16.3		
Gate-Drain Charge	Q_{gd}			12.8		
Gate Plateau Volitage	V_{gp}			7		V
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=380V, V_{GS} =10V, I_D =13A, R_G=1.7Ω		43		nS
Turn-on Rise Time	t_r			16		
Turn-off Delay Time	$t_{d(off)}$			93		
Turn-off Fall Time	t_f			20		
Source-Drain Diode Characteristics						
Diode Forward Current	I_{SD}	T_C=25°C			26	A
Diode Forward Pulse Current	I_{SDM}				78	A
Diode Forward voltage	V_{SD}	T_J=25℃,V_{GS} =0V, I_{SD}=26A			1.2	V
Reverse Recovery Time	t_{rr}	T_J=25℃,I_F=13A, di/dt=100A/μs		145		nS
Reverse Recovery Charge	Q_{rr}			0.725		uC
Peak Reverse Recovery Current	I_{rrm}			10		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

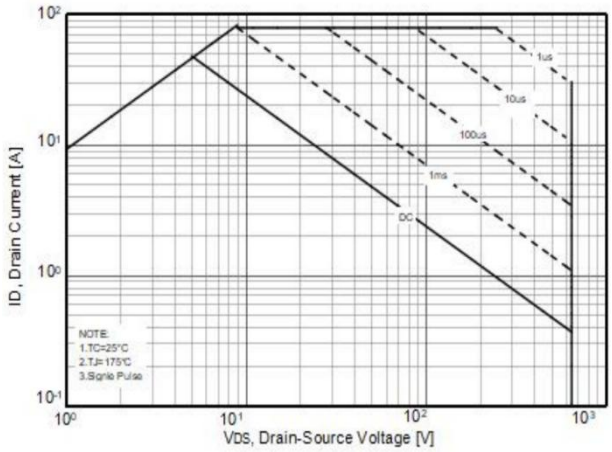


Figure2. Capacitance

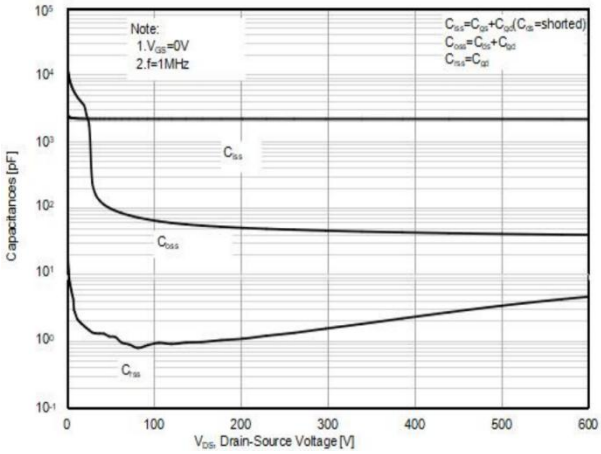


Figure3. Output characteristics

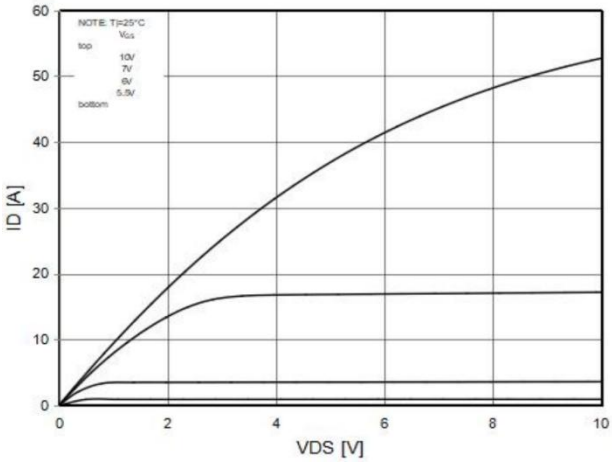


Figure4. Source-Drain Diode Forward Voltage

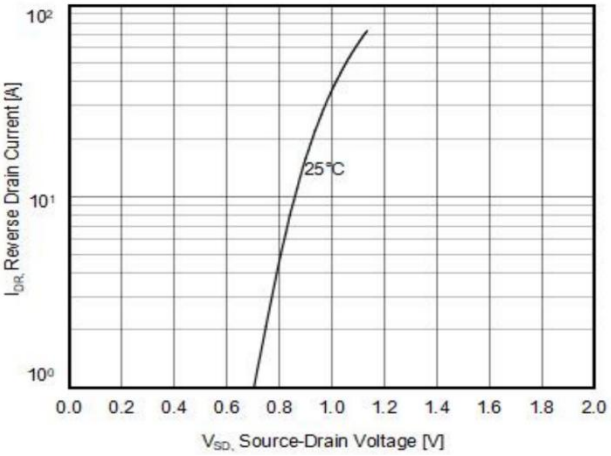


Figure5. Static drain-source on resistance

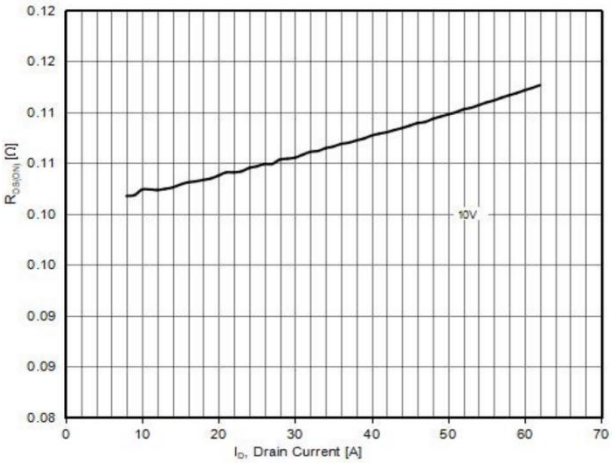
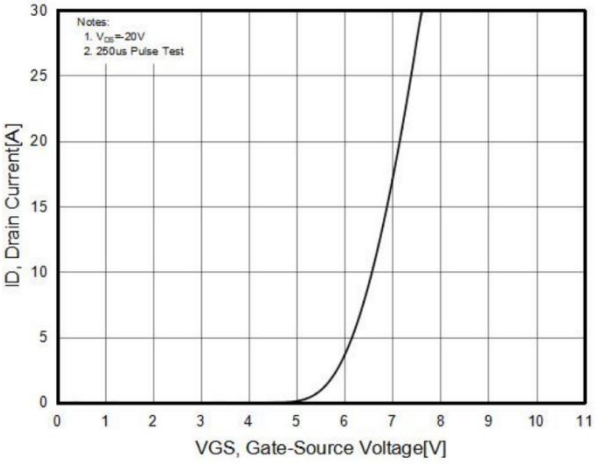


Figure6. Transfer characteristics



Typical Characteristics

Figure7. $R_{DS(ON)}$ vs Junction Temperature

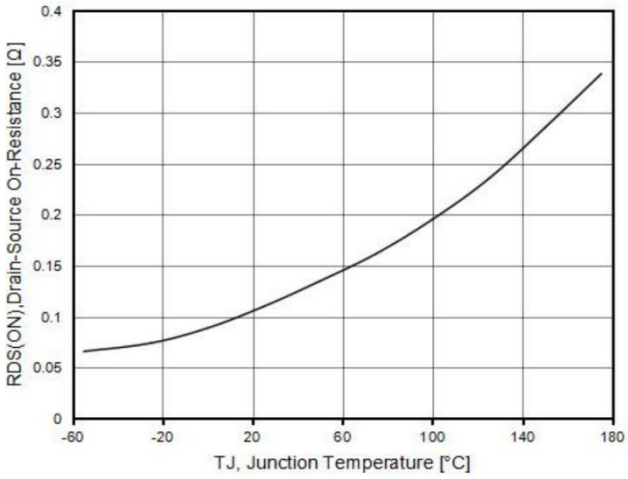


Figure8. BV_{DSS} vs Junction Temperature

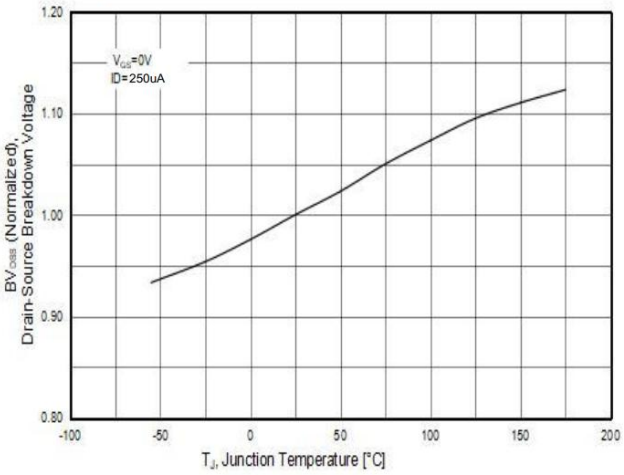


Figure9. Gate charge waveforms

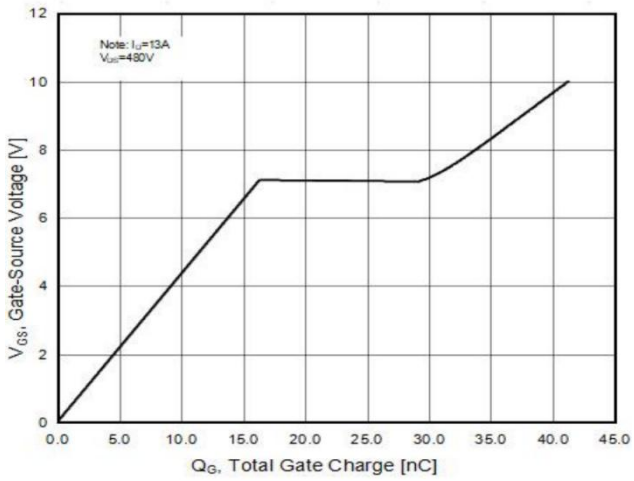
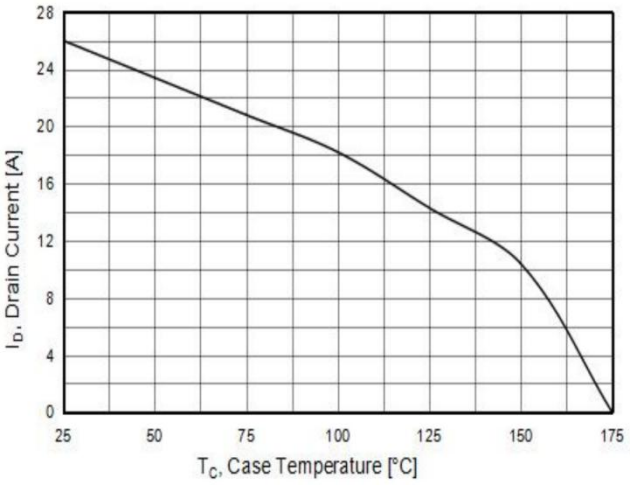
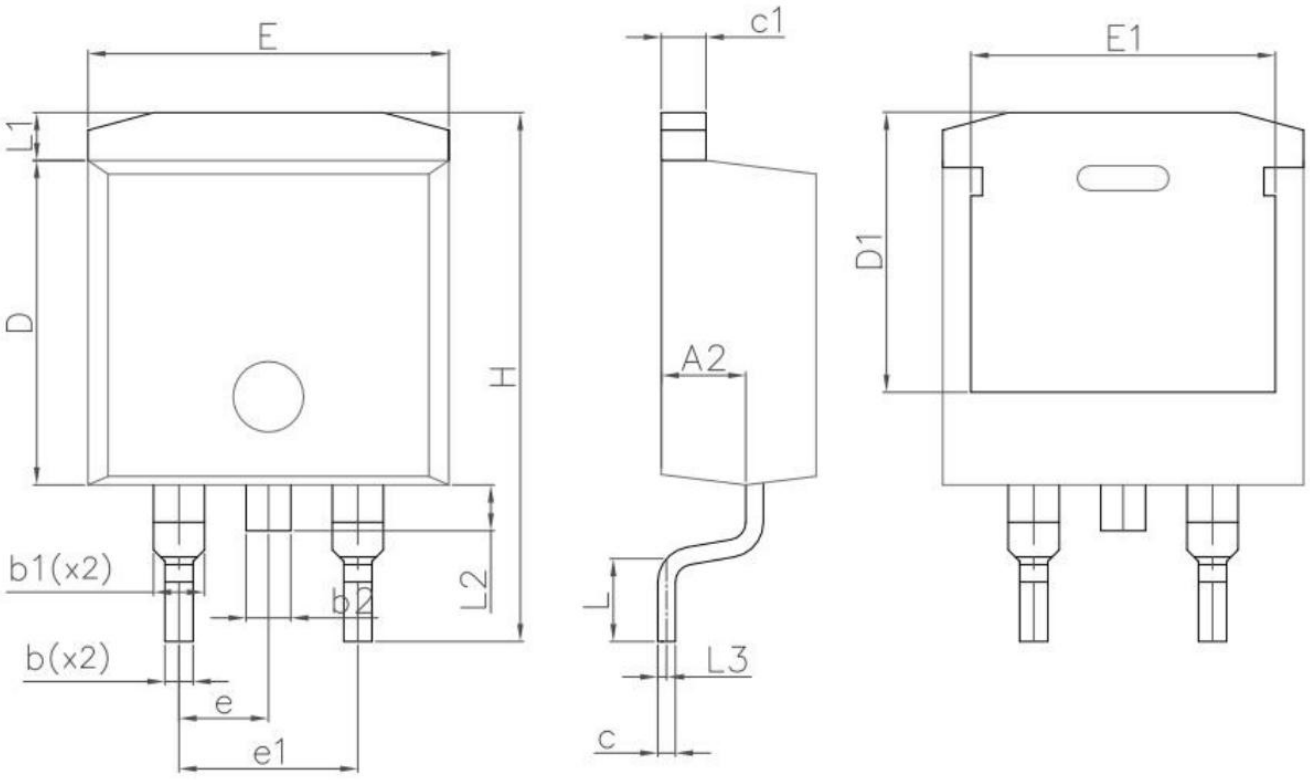


Figure10. Maximum I_D vs Junction Temperature



TO-263AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A2	4.200	4.600	0.165	0.181
b	0.700	0.900	0.028	0.035
b1	1.200	1.750	0.047	0.069
b2	1.170	1.370	0.046	0.054
c	0.400	0.600	0.016	0.024
c1	1.150	1.400	0.045	0.055
D	9.100	9.300	0.358	0.366
D1	7.630	8.230	0.300	0.324
E	10.050	10.450	0.396	0.411
E1	8.350	8.950	0.329	0.352
e	2.540 BSC		0.100 BSC	
e1	5.080 BSC		0.200 BSC	
H	14.610	15.880	0.575	0.625
L	1.780	2.790	0.070	0.110
L1	1.360 REF		0.054 REF	
L2	1.300 REF		0.051 REF	

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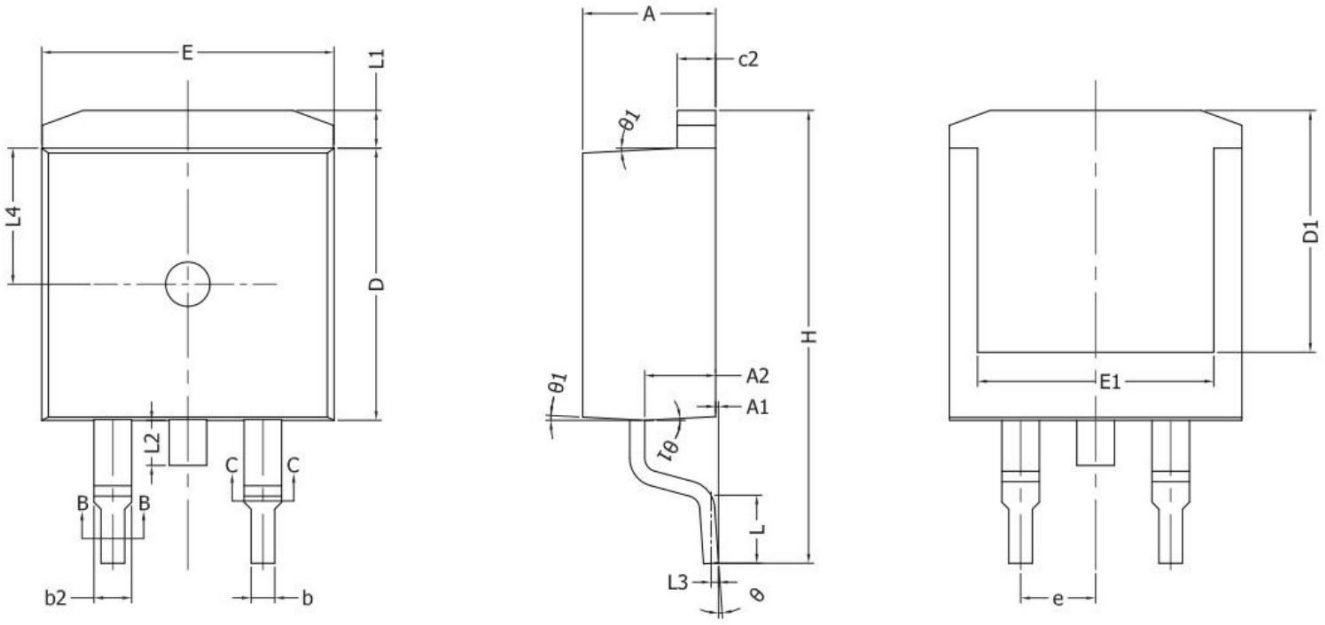

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.400	4.600	0.173	0.181
A1	0.000	0.250	0.000	0.010
A2	2.200	2.600	0.087	0.102
b	0.760	0.890	0.030	0.035
b1	0.750	0.850	0.030	0.033
b2	1.230	1.370	0.048	0.054
b3	1.220	1.320	0.048	0.052
c	0.470	0.600	0.019	0.024
c1	0.460	0.560	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	2.540 BSC		0.100 BSC	
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	0.250 REF		0.010 REF	
L4	4.600 REF		0.181 REF	