APR130N65S-Q1

N-Channel Super Junction Power MOSFET

Product Summary

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

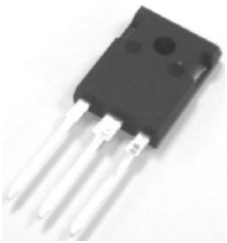
Feature

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

Application

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

Package



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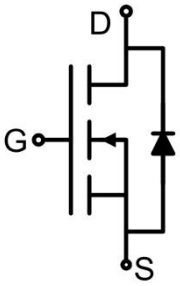
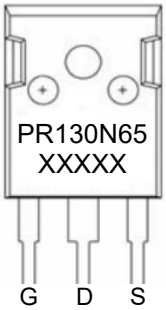
Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage (V_{GS}=0V)	V_{DS}	650	V
Gate-Source Voltage (V_{DS}=0V) AC (f>1 Hz)	V_{GS}	±30	V
Gate-Source Voltage (V_{DS}=0V) DC	V_{GS}	±20	V
Continuous Drain Current(DC)	I_D	26	A
Continuous Drain Current (DC,T_C=100℃)	I_D(100℃)	18.2	A
Pulsed Drain Current[1)]	I_{DM}	78	A
Power Dissipation	P_D	237	W
Avalanche current[1)]	I_{AS}	7	A
Thermal Resistance,Junction-to-Ambient	$R_{\theta JA}$	62	℃/W
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	0.63	℃/W
Junction Temperature	T_J	175	℃
Storage Temperature	T_{STG}	-55 ~ +175	℃

Electrical characteristics (T_A=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	650			V
Zero gate voltage drain current(T_C=25℃)	I_{DSS}	V_{DS} =650V,V_{GS} = 0V			10	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 =500uA	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[2)]						
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		
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 voltage	V_{gp}			7.0		V
Intrinsic gate resistance	R_G	f = 1 MHz open drain		1.5		Ω
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℃			26	A
Diode Forward voltage	V_{SD}	V_{GS} =0V, I_{SD}=26A, T_J=25℃			1.2	V
Reverse Recovery Time	t_{rr}	T_J = 25°C, 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) Guaranteed by design, not subject to production testing.

Typical Characteristics

Figure1. Safe operating area

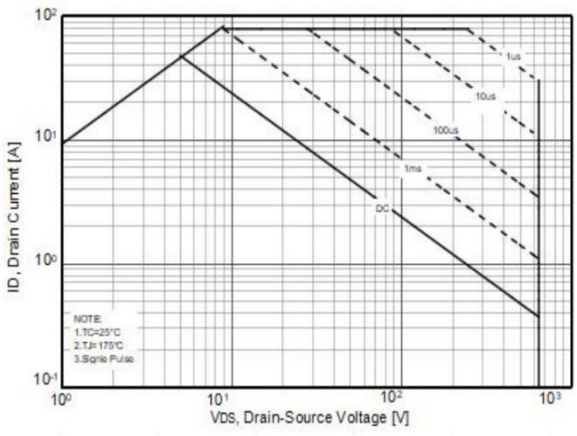


Figure2. Capacitance

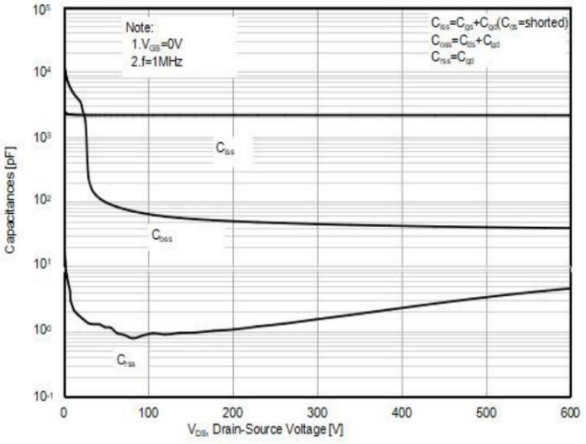


Figure3. Output characteristics

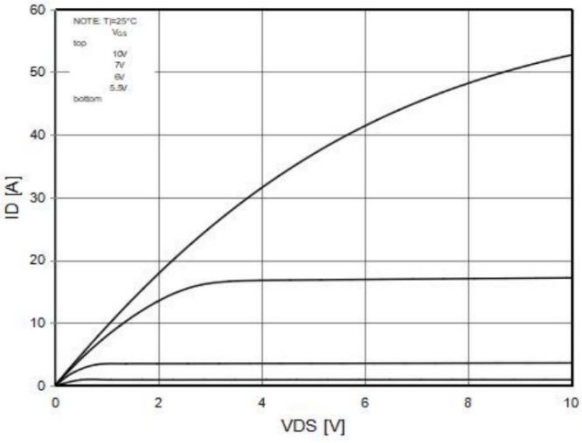


Figure4. Source-Drain Diode Forward Voltage

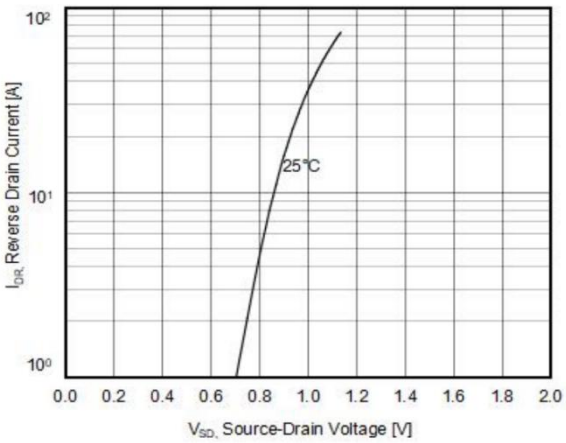


Figure5. Static drain-source on resistance

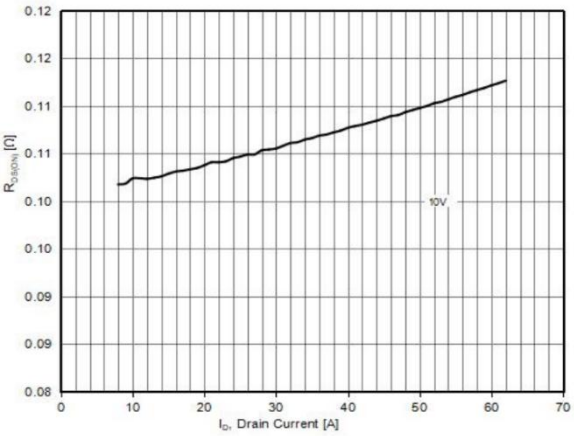
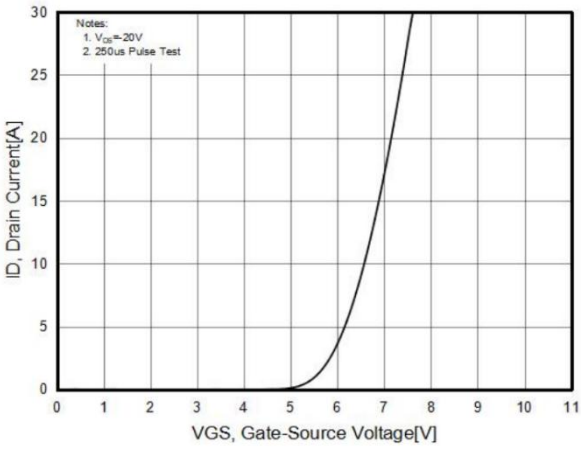


Figure6. Transfer characteristics



Typical Characteristics

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

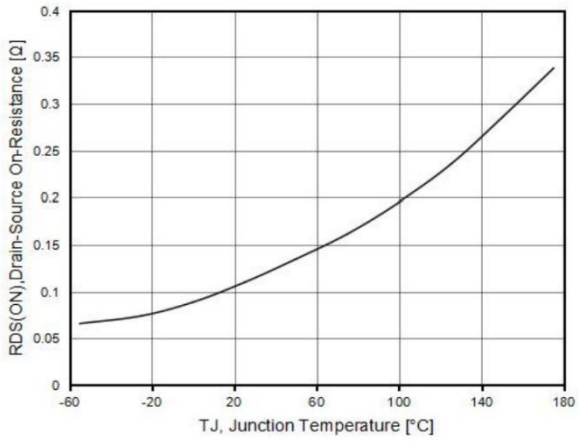


Figure8. BV_{DSS} vs Junction Temperature

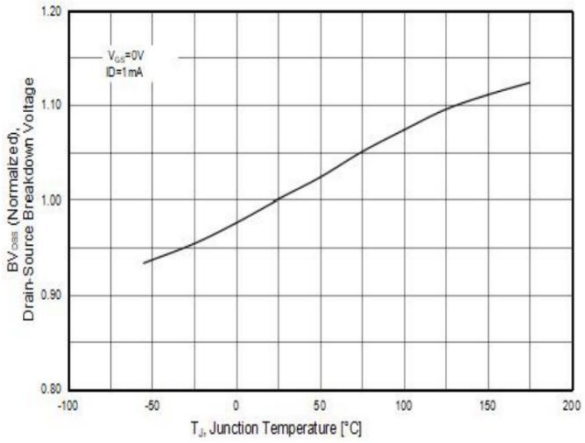


Figure9. Gate charge waveforms

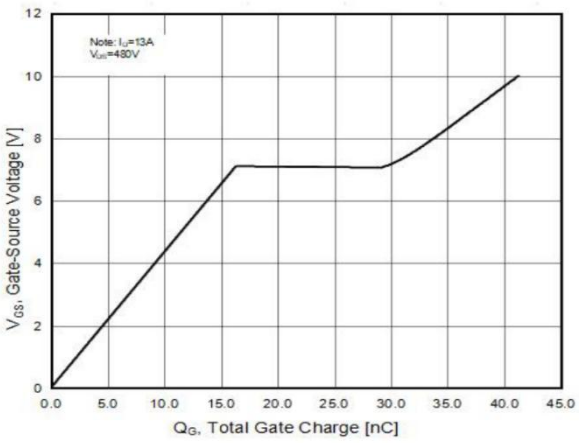
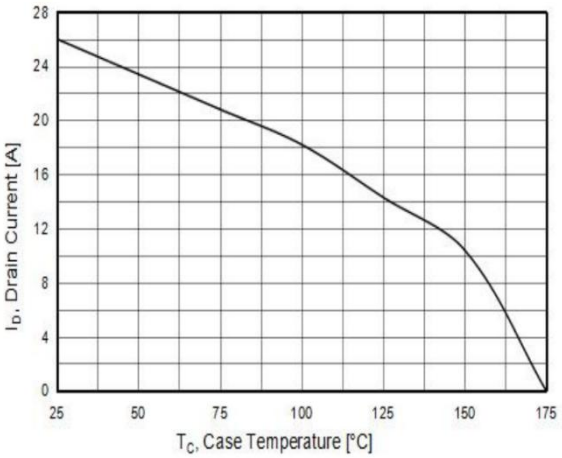


Figure10. Maximum I_D vs Junction Temperature



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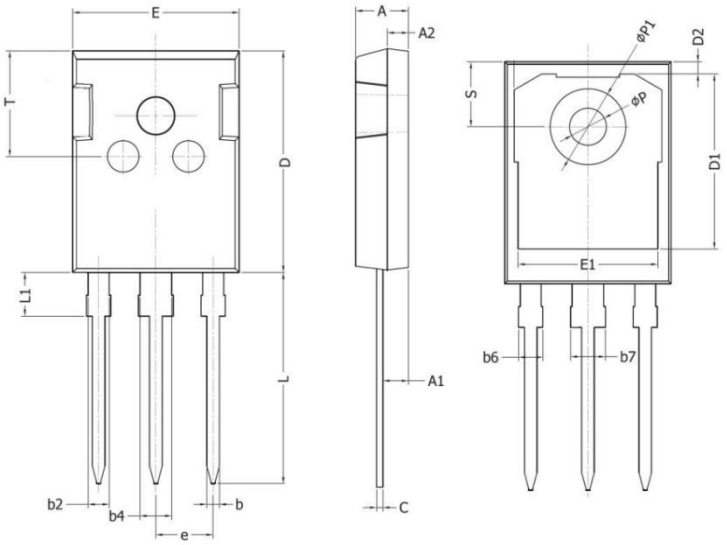

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.900	5.100	0.193	0.201
A1	2.310	2.510	0.091	0.099
A2	1.900	2.100	0.075	0.083
b	1.160	1.260	0.046	0.050
b2	1.960	2.060	0.077	0.081
b4	2.960	3.060	0.117	0.120
b6	-	2.250	-	0.089
b7	-	3.250	-	0.128
C	0.590	0.660	0.023	0.026
D	20.900	21.100	0.823	0.831
D1	16.250	16.850	0.64	0.663
D2	1.050	1.350	0.041	0.053
E	15.700	15.900	0.618	0.626
E1	13.100	13.500	0.516	0.531
e	5.436 BSC.		0.214 BSC	
L	19.800	20.100	0.780	0.791
L1	-	4.300	-	0.169
P	3.400	3.600	0.134	0.142
P1	7.000	7.400	0.276	0.291
S	6.050	6.250	0.238	0.246
T	9.800	10.200	0.386	0.402