

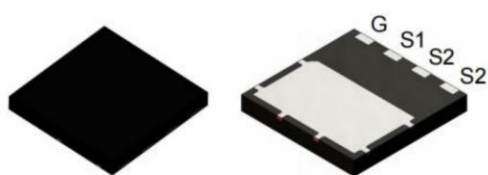
Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
650V	180mΩ@10V	20A

Feature

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

Package

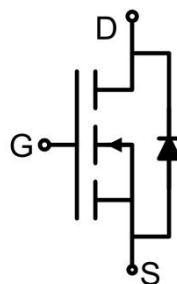


DFN8*8

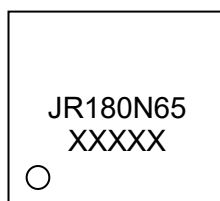
Application

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

Circuit diagram



Marking



Absolute maximum ratings (T_C=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	650	V
Gate-Source Voltage	V _{GS}	±20	V
Continuous Drain Current	I _D	20	A
Continuous Drain Current (T _C =100°C)	I _D (100°C)	14	A
Pulsed Drain Current ¹⁾	I _{DM}	60	A
Power Dissipation	P _D	194	W
Derate above 25°C	-	1.29	W/°C
Thermal Resistance,Junction-to-Case	R _{θJC}	0.77	°C/W
Single pulse avalanche energy ²⁾	E _{AS}	144	mJ
Avalanche current ¹⁾	I _{AS}	6	A
Repetitive Avalanche energy, t _{AR} limited by T _{jmax} ¹⁾	E _{AR}	0.73	mJ
Junction Temperature	T _J	175	°C
Storage Temperature	T _{STG}	-55 ~ +175	°C

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	I _{DSS}	V _{DS} =650V, V _{GS} = 0V, T _C =25°C			1	μA
		V _{DS} =650V, V _{GS} = 0V, T _C =125°C			100	
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	3	3.5	4	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =10A		160	180	mΩ
Dynamic characteristics ³⁾						
Input Capacitance	C _{iss}	V _{DS} =50V, V _{GS} =0V, f =1MHz		1200		pF
Output Capacitance	C _{oss}			50		
Reverse Transfer Capacitance	C _{rss}			1.5		
Gate Resistance	R _g	f =1MHz, open drain		2		Ω
Total Gate Charge	Q _g	V _{DS} =480V, V _{GS} =10V, I _D =10.5A		23		nC
Gate-Source Charge	Q _{gs}			9		
Gate-Drain Charge	Q _{gd}			6.5		
Gate Plateau Voltage	V _{gp}			6.1		V
Turn-on delay time	t _{d(on)}	V _{DD} =380V, V _{GS} =10V, I _D =10A, R _G =1.7Ω		32		nS
Turn-on rise time	t _r			18		
Turn-off delay time	t _{d(off)}			90		
Turn-off fall time	t _f			8		
Source-Drain Diode characteristics						
Diode Forward Current	I _{SD}	T _C =25°C			20	A
Diode Forward Pulse Current	I _{SDM}				60	
Diode Forward voltage	V _{SD}	V _{GS} =0V, I _{SD} =20A, T _J =25°C			1.2	V
Reverse Recovery Time	t _{rr}	T _J =25°C, I _F =10A, di/dt =100A/μs		300		nS
Reverse Recovery Charge	Q _{rr}			4.5		μC
Peak Reverse Recovery Current	I _{rrm}			30		A

Notes:

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

2) T_J=25°C, V_{DD}=50V, V_G=10V, R_G=25Ω.

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

Typical Characteristics

Figure1. Safe operating area

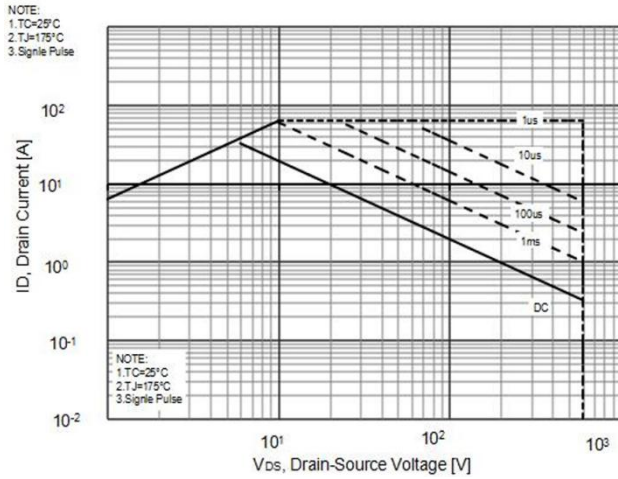


Figure2. Capacitance

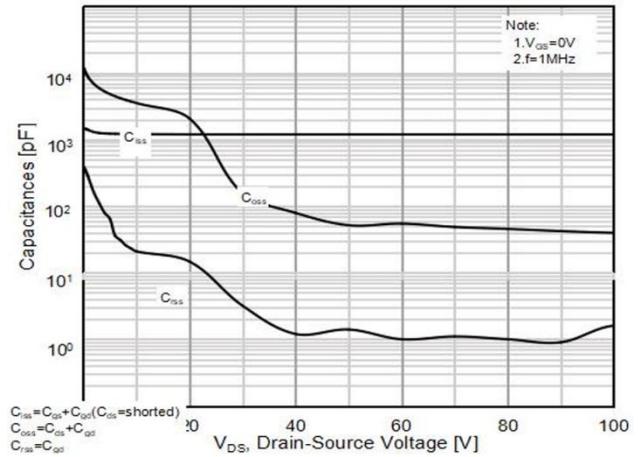


Figure3. Source-Drain Diode Forward Voltage

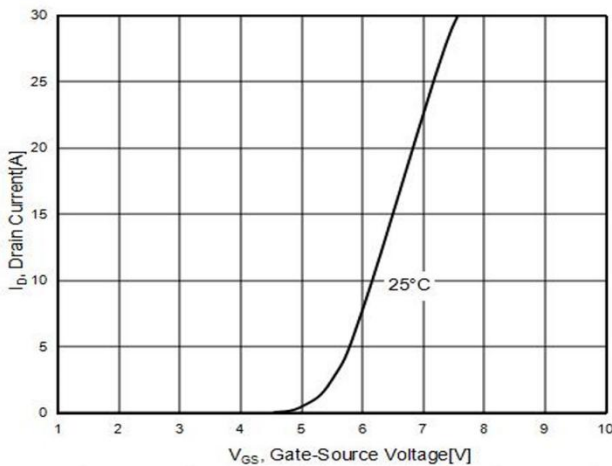


Figure4. Output characteristics

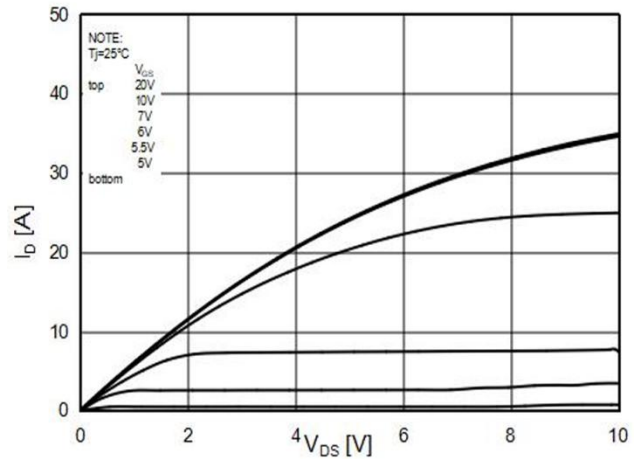


Figure5. $R_{DS(ON)}$ vs Junction Temperature

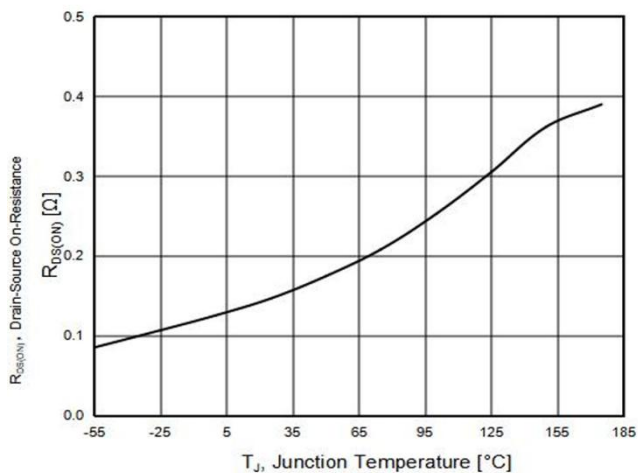
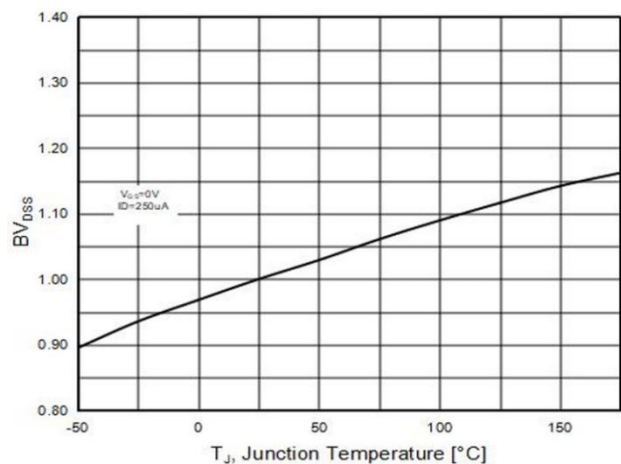


Figure6. BV_{DSS} vs Junction Temperature



Typical Characteristics

Figure7. Maximum I_D vs Junction Temperature

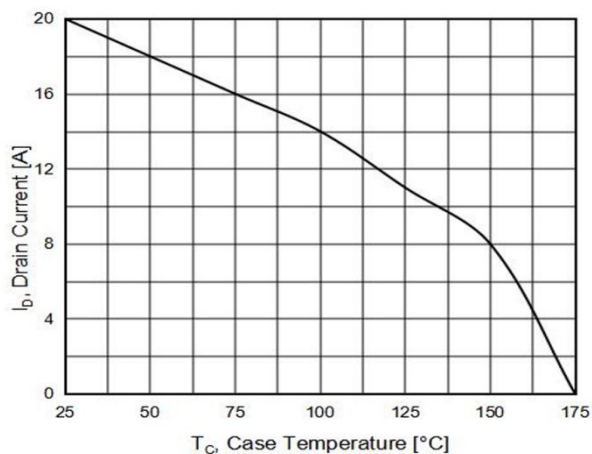


Figure8. Gate charge waveforms

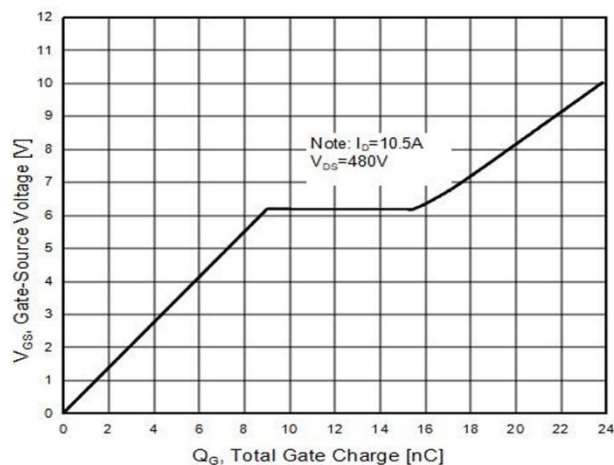


Figure9. Static drain-source on resistance

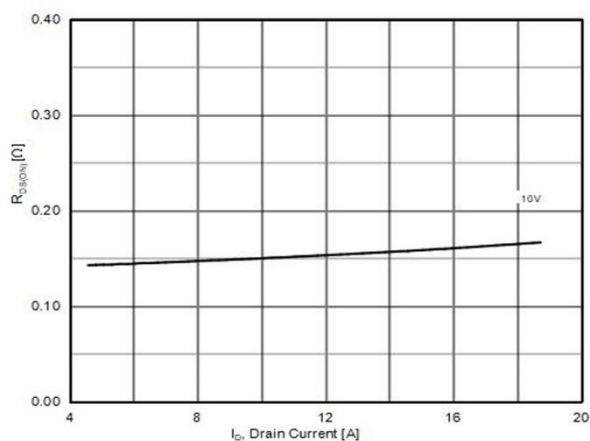
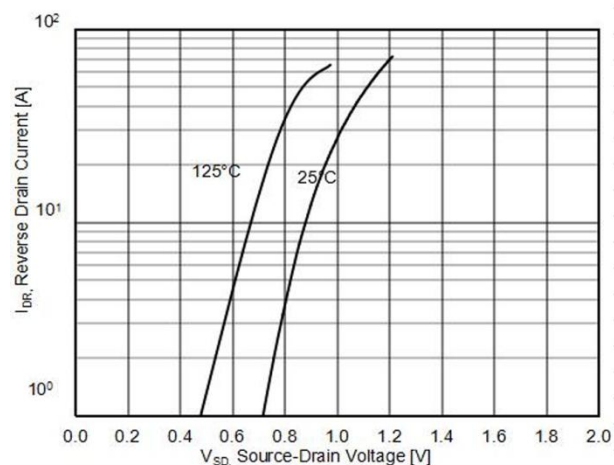
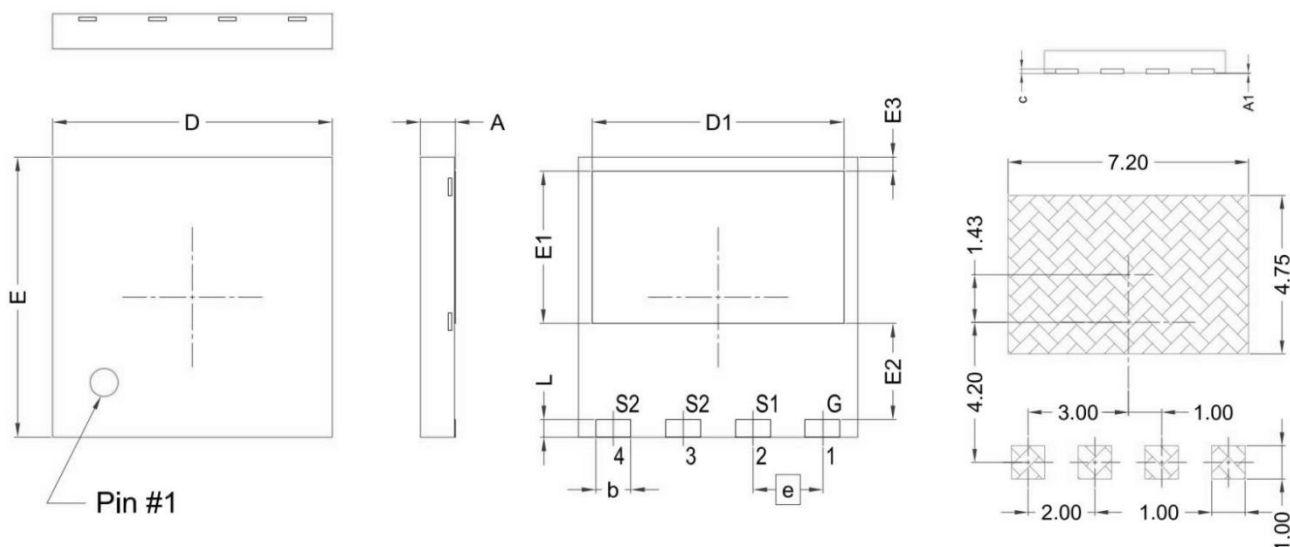


Figure10. Source-Drain Diode Forward Voltage



DFN8*8 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.750	1.100	0.030	0.043
A1	0.000	0.050	0.000	0.002
b	0.900	1.100	0.035	0.043
c	0.100	0.300	0.004	0.012
D	7.900	8.100	0.311	0.319
D1	7.100	7.300	0.280	0.287
E	7.900	8.100	0.311	0.319
E1	4.250	4.450	0.167	0.175
E2	2.650	2.850	0.104	0.112
E3	0.300	0.500	0.012	0.020
e	2.000 BSC		0.079	0.000
L	0.400	0.600	0.016	0.024