

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
40V	2.8mΩ@10V	65A
	4.2mΩ@4.5V	

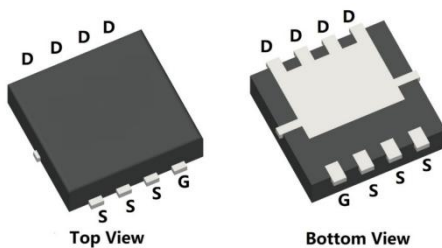
Feature

- Excellent gate charge x $R_{DS(on)}$ product(FOM)
- Very low on-resistance $R_{DS(on)}$
- Suffix "-Q1" for AEC-Q101

Application

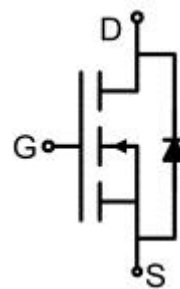
- DC/DC converter
- Ideal for high-frequency switching and synchronous rectification

Package

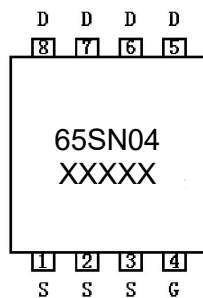


PDFN3.3*3.3-8L

Circuit diagram



Marking



Absolute maximum ratings (T_c=25°C 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	65	A
Continuous Drain Current (T _c =100°C)	I _D (100°C)	45.5	A
Pulsed Drain Current ¹⁾	I _{DM}	260	A
Single Pulse Avalanche Energy ²⁾	E _{AS}	500	mJ
Power Dissipation	P _D	55	W
Thermal Resistance Junction to Case	R _{θJC}	2.3	°C/W
Operating Junction Temperature	T _J	-55 ~ +150	°C
Storage Temperature	T _{STG}	-55 ~ +150	°C

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 _{DS} =0V, V _{GS} =±20V			±100	nA
Gate threshold voltage ³⁾	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1	1.5	2	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =20A		2.2	2.8	mΩ
		V _{GS} =4.5V, I _D =20A		3.3	4.2	
Dynamic characteristics ⁴⁾						
Input Capacitance	C _{iss}	V _{DS} =20V, V _{GS} =0V, f =1MHz		2100		pF
Output Capacitance	C _{oss}			773		
Reverse Transfer Capacitance	C _{rss}			15.5		
Total Gate Charge	Q _g	V _{DS} =20V, V _{GS} =10V, I _D =20A		34.8		nC
Gate-Source Charge	Q _{gs}			6.2		
Gate-Drain Charge	Q _{gd}			5.1		
Turn-on delay time	t _{d(on)}	V _{DS} =20V, V _{GS} =10V, I _D =20A R _G =1.6Ω		7.5		nS
Turn-on rise time	t _r			4		
Turn-off delay time	t _{d(off)}			37		
Turn-off fall time	t _f			7.5		
Source-Drain Diode characteristics						
Diode Forward Current	I _S				65	A
Diode Forward voltage ³⁾	V _{SD}	V _{GS} =0V, I _S =20A			1.2	V
Reverse Recovery Time	T _{rr}	I _F =I _S , di/dt =100A/μs ³⁾		14		nS
Reverse Recovery Charge	Q _{rr}	T _J =25°C		21		nC

Notes:

- 1) Repetitive Rating: Pulse width limited by maximum junction temperature.
- 2) EAS condition : T_j=25°C, V_{DD}=20V, V_G=10V, L=0.5mH, R_G=25Ω.
- 3) Pulse Test: Pulse Width ≤300μs, Duty Cycle ≤2%.
- 4) Guaranteed by design, not subject to production.

Typical Characteristics

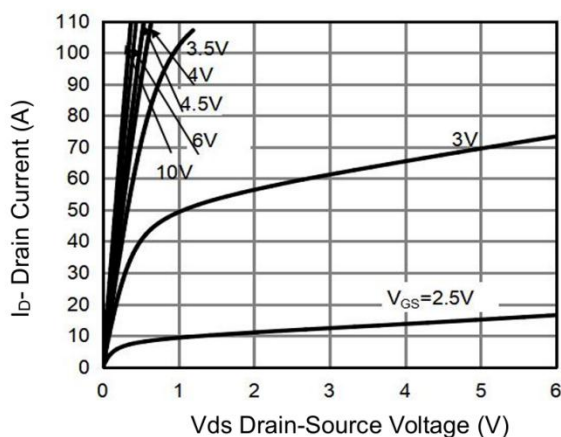


Figure 1 Output Characteristics

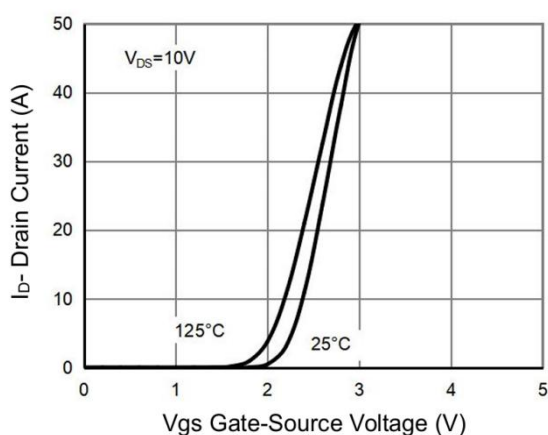


Figure 2 Transfer Characteristics

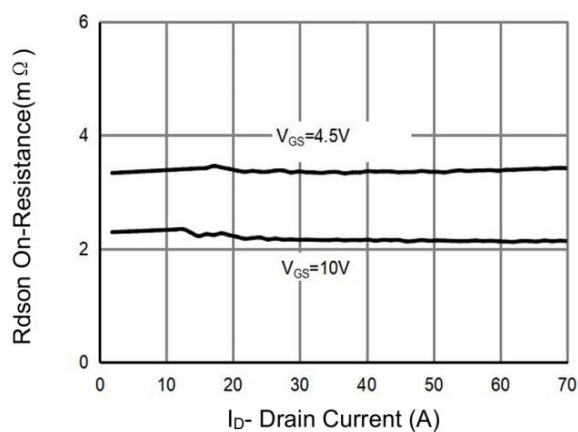


Figure 3 Rdson- Drain Current

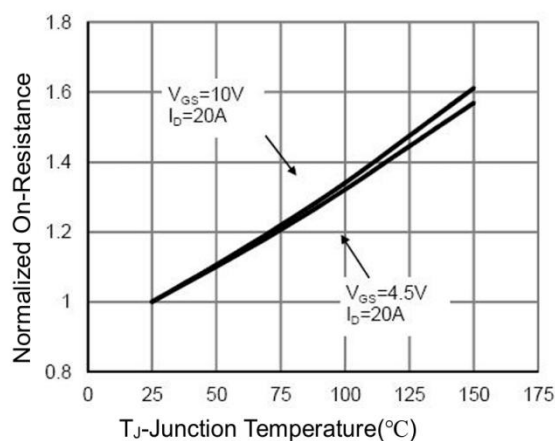


Figure 4 Rdson-Junction Temperature

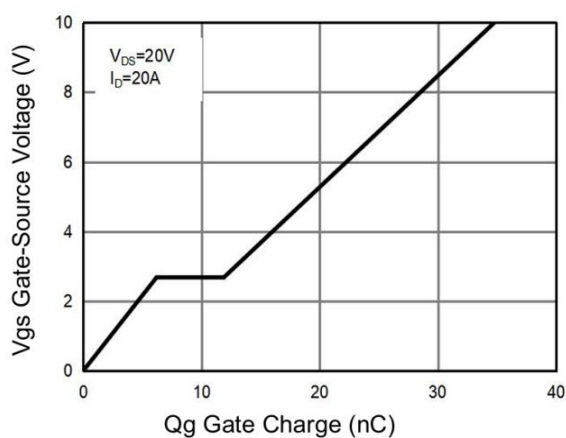


Figure 5 Gate Charge

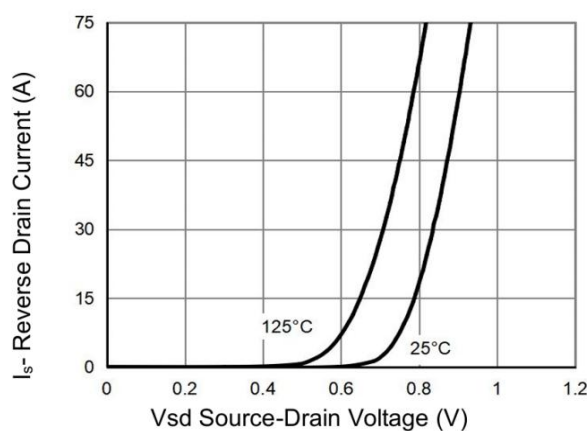


Figure 6 Source- Drain Diode Forward

Typical Characteristics

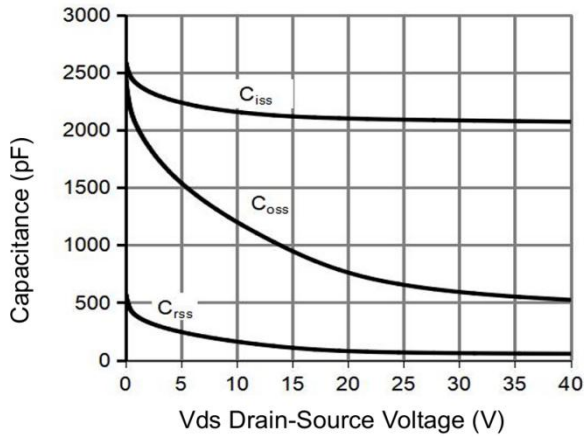


Figure 7 Capacitance vs Vds

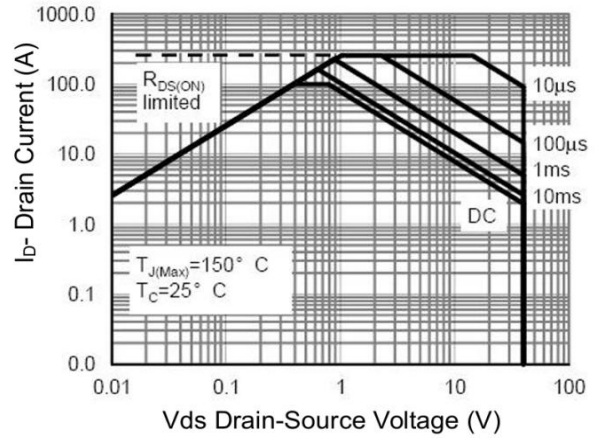


Figure 8 Safe Operation Area

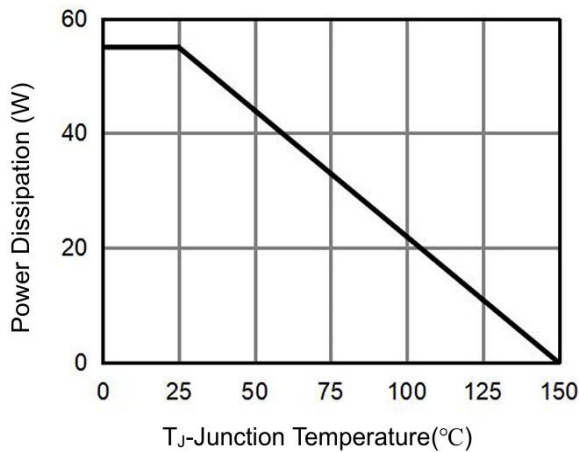


Figure 9 Power De-rating

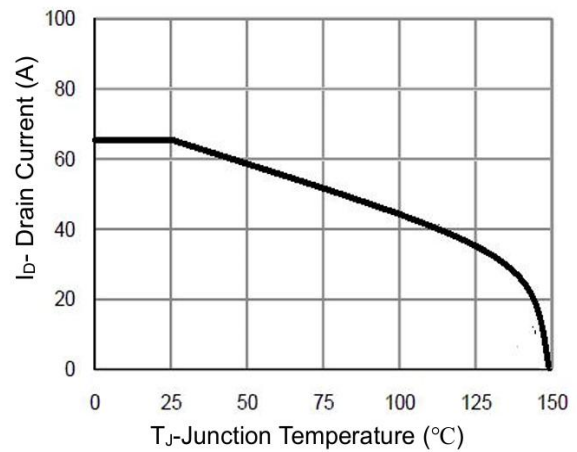


Figure 10 Current De-rating

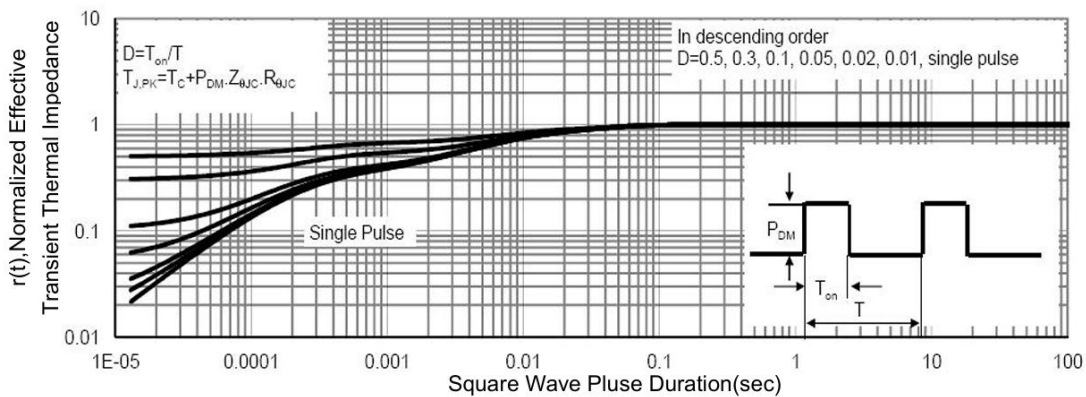
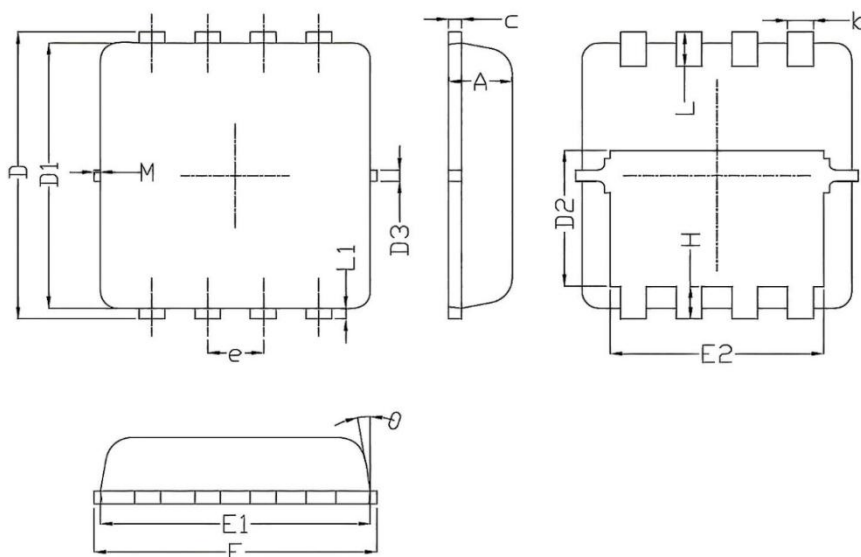


Figure 11 Normalized Maximum Transient Thermal Impedance

PDFN3.3*3.3-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.800	0.028	0.031
b	0.250	0.350	0.010	0.014
c	0.100	0.250	0.004	0.010
D	3.250	3.450	0.128	0.136
D1	3.000	3.200	0.118	0.126
D2	1.480	1.680	0.058	0.066
D3	0.130 RFE.		0.005 RFE.	
E	3.200	3.400	0.126	0.134
E1	3.000	3.200	0.118	0.126
E2	2.390	2.590	0.094	0.102
e	0.650 BSC.		0.026 BSC.	
H	0.300	0.500	0.012	0.020
L	0.300	0.500	0.012	0.020
L1	0.130 RFE.		0.005 RFE.	
M	-	0.150	-	0.006
θ	-	12°	-	12°