

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
150V	65mΩ@10V	20A

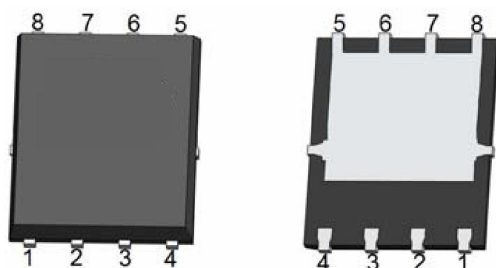
Feature

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

Application

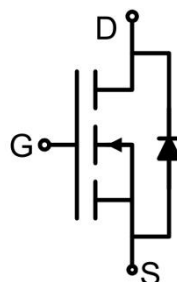
- DC/DC converters
- Ideal for high-frequency switching and synchronous rectification

Package

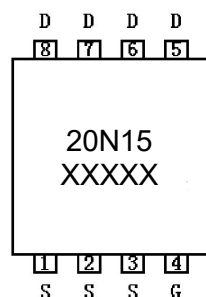


DFN5X6-8L

Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	150	V
Gate-Source Voltage	V _{GS}	±20	V
Continuous Drain Current	I _D	20	A
Continuous Drain Current (T _C = 100°C)	I _D	14	A
Pulsed Drain Current	I _{DM}	80	A
Power Dissipation	P _D	68	W
Thermal Resistance, Junction-to-Case ¹⁾	R _{θJC}	1.84	°C/W
Single pulse avalanche energy ⁴⁾	E _{AS}	65	mJ
Junction Temperature	T _J	150	°C
Storage Temperature	T _{STG}	-55 ~ +150	°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	150			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =150V,V _{GS} = 0V			1	μA
Gate-body leakage current	I _{GSS}	V _{GS} =±20V, V _{DS} = 0V			±100	nA
Gate threshold voltage ²⁾	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	2.5	3.3	4.5	V
Drain-source on-resistance ²⁾	R _{DS(on)}	V _{GS} =10V, I _D =10A		59	65	mΩ
Gate resistance ²⁾	R _G			4.5		Ω
Dynamic characteristics ³⁾						
Input Capacitance	C _{iSS}	V _{DS} =75V, V _{GS} =0V, f =1MHz		600		pF
Output Capacitance	C _{oSS}			74.7		
Reverse Transfer Capacitance	C _{rSS}			10.8		
Total Gate Charge	Q _g	V _{DS} =75V, V _{GS} =10V, I _D =10A		12		nC
Gate-Source Charge	Q _{gs}			2.8		
Gate-Drain Charge	Q _{gd}			1.8		
Turn-on delay time	t _{d(on)}	V _{DD} =75V, V _{GS} =10V, R _G =3Ω, R _L =7.5Ω		9.5		nS
Turn-on rise time	t _r			5.5		
Turn-off delay time	t _{d(off)}			12.5		
Turn-off fall time	t _f			3		
Source-Drain Diode characteristics						
Diode Forward Current ¹⁾	I _S				20	A
Diode Forward voltage ²⁾	V _{SD}	V _{GS} =0V, I _S =10A			1.2	V
Reverse Recovery Time	t _{rr}	T _J =25°C, I _F =I _S		29		nS
Reverse Recovery Charge	Q _{rr}	di/dt = 100A/μs ²⁾		130		nC

Notes:

- 1) Surface Mounted on FR4 Board, t ≤ 10 sec.
- 2) Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
- 3) Guaranteed by design, not subject to production.
- 4) EAS condition : T_J = 25°C, V_{DD} = 50V, V_G = 10V, L = 0.5mH, R_G = 25Ω.

Typical Characteristics

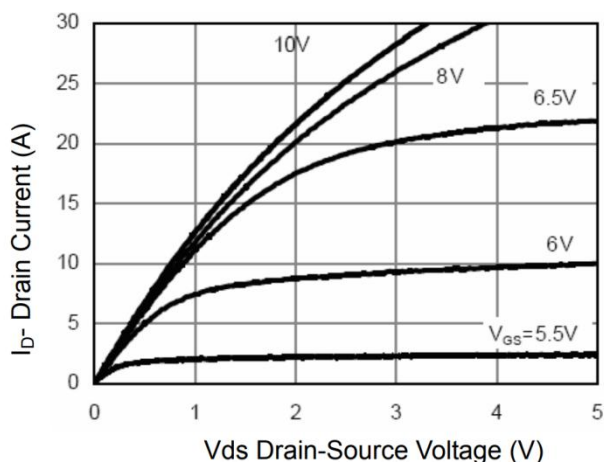


Figure 1 Output Characteristics

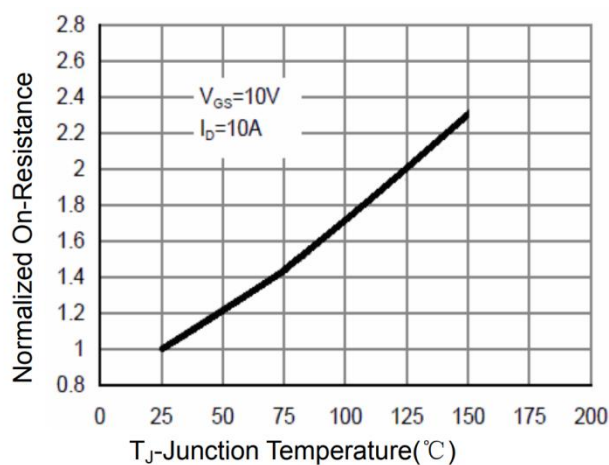


Figure 2 Rdson-Junction Temperature

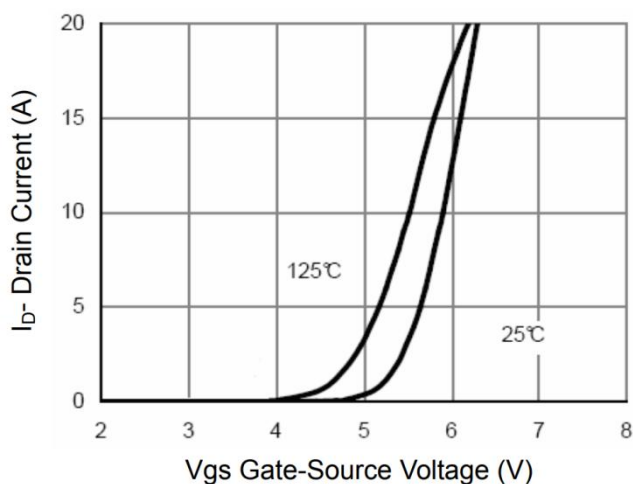


Figure 3 Transfer Characteristics

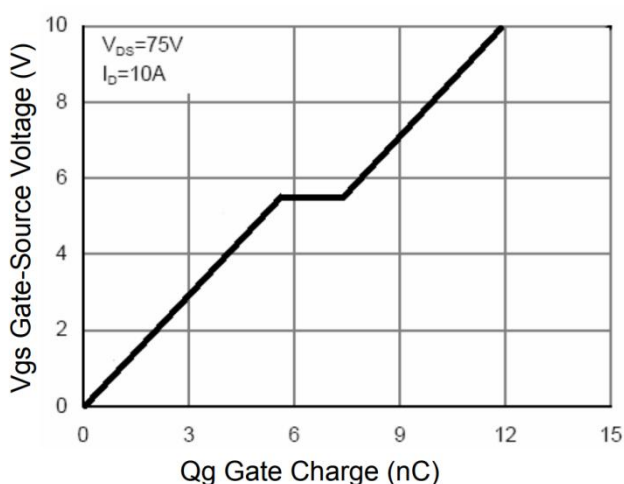


Figure 4 Gate Charge

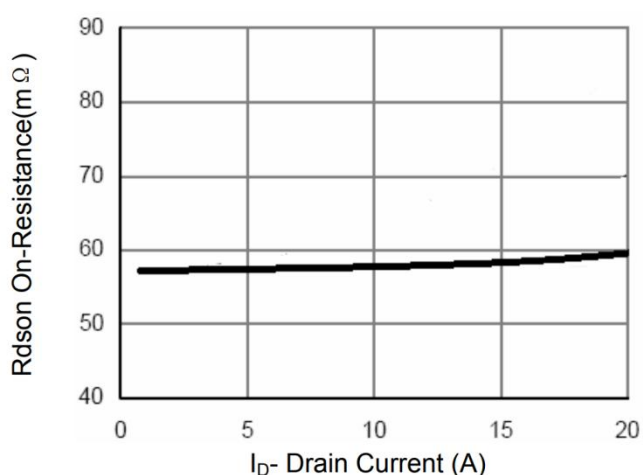


Figure 5 Rdson- Drain Current

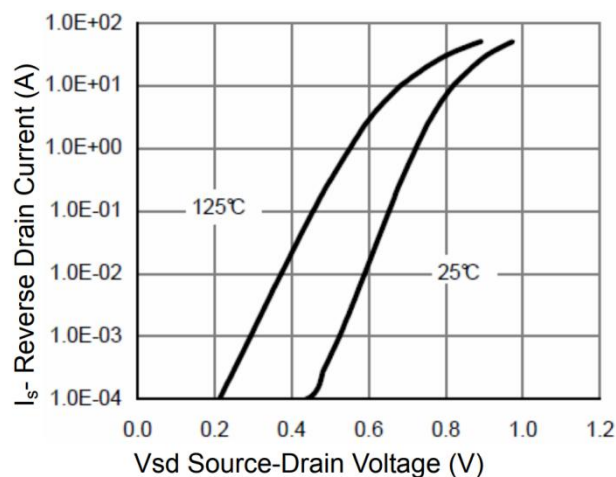


Figure 6 Source- Drain Diode Forward

Typical Characteristics

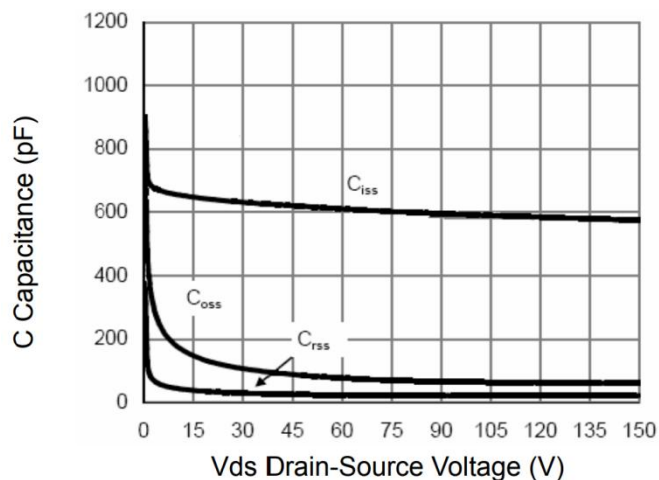


Figure 7 Capacitance vs Vds

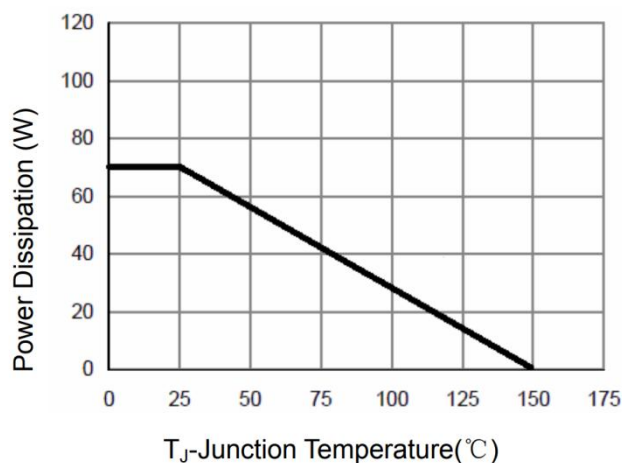


Figure 8 Power De-rating

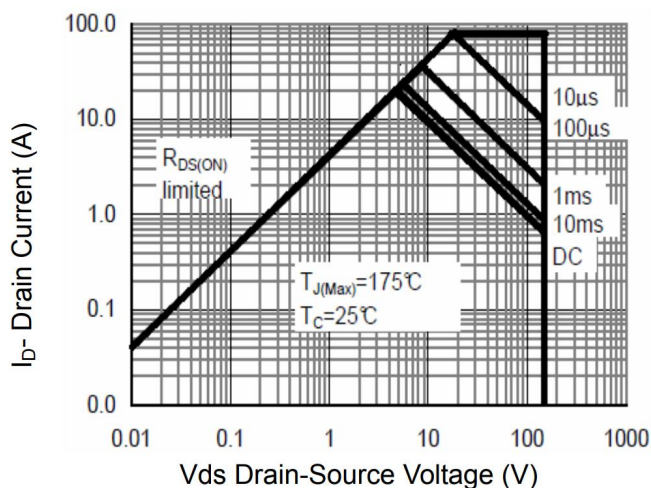


Figure 9 Safe Operation Area

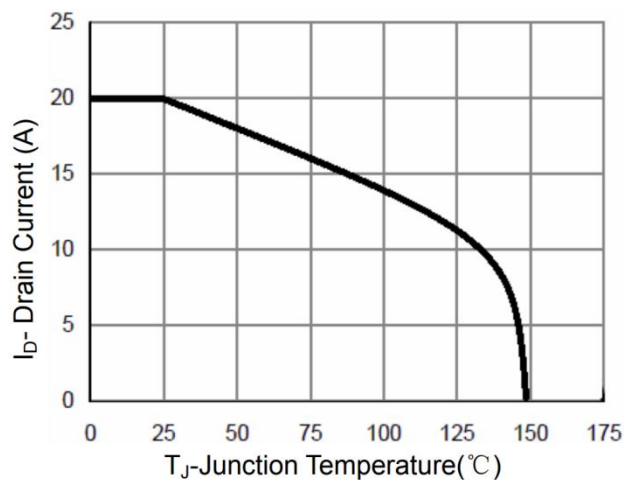


Figure 10 Current De-rating

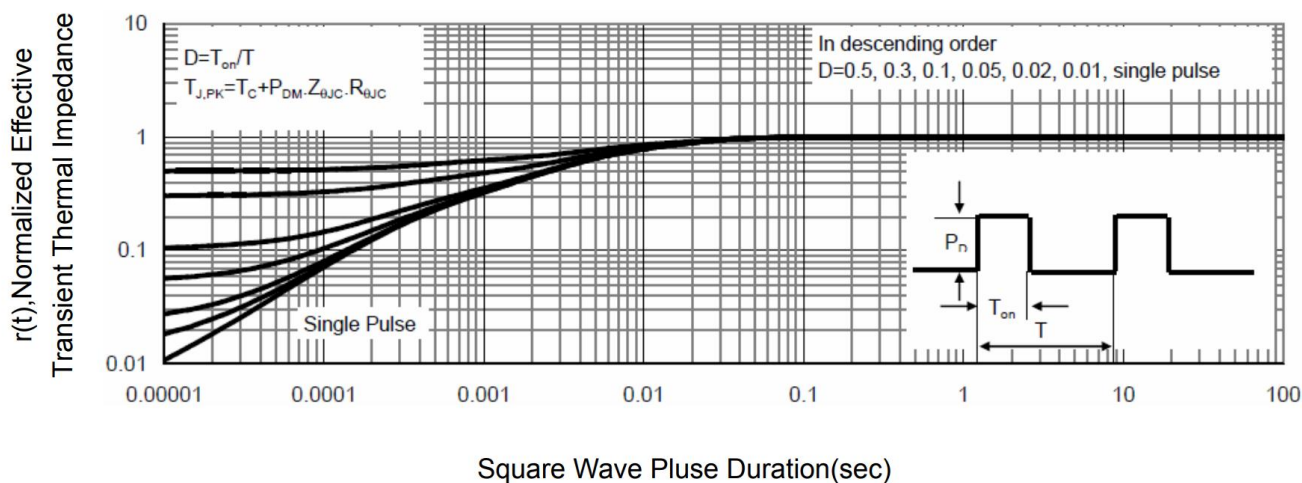
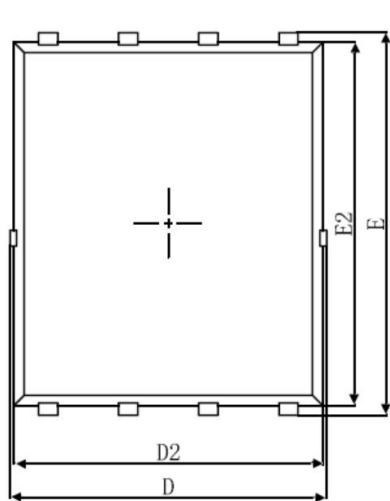
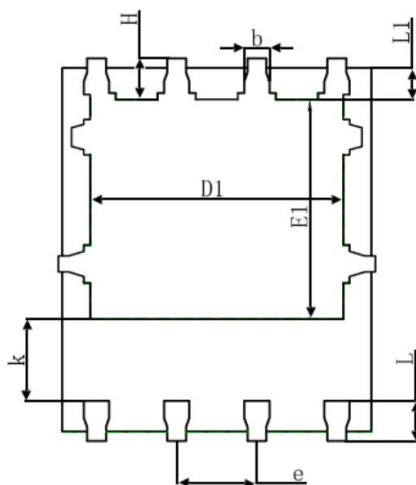


Figure 11 Normalized Maximum Transient Thermal Impedance

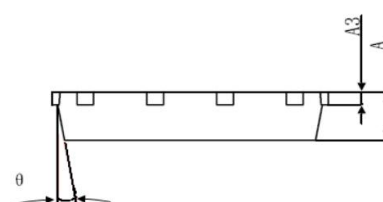
DFN5X6-8L Package Information



Top View



Bottom View



Side View

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.000	0.035	0.039
A3	0.254REF.		0.010REF.	
D	4.944	5.096	0.195	0.201
E	5.974	6.126	0.235	0.241
D1	3.910	4.110	0.154	0.162
E1	3.375	3.575	0.133	0.141
D2	4.824	4.976	0.190	0.196
E2	5.674	5.826	0.223	0.229
k	1.190	1.390	0.047	0.055
b	0.350	0.450	0.014	0.018
e	1.270TYP.		0.050TYP.	
L	0.559	0.711	0.022	0.028
L1	0.424	0.576	0.017	0.023
H	0.574	0.726	0.023	0.029
θ	8°	12°	8°	12°