

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_b
60V	4mΩ@10V	80A
	5mΩ@4.5V	

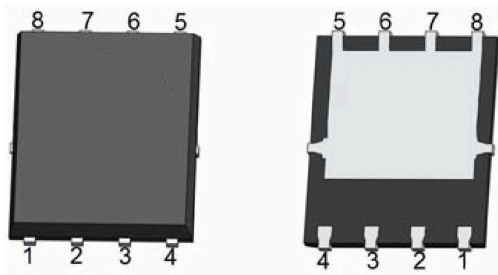
Feature

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

Application

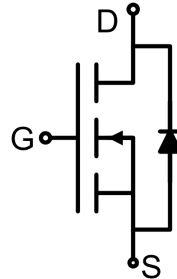
- DC/DC Converter
- Power management functions
- Industrial and Motor Drive application

Package

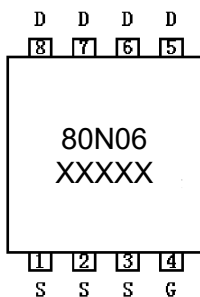


DFN5X6-8L

Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current (Silicon limited)	I_D	80	A
Drain Current-Continuous($T_C = 100^\circ\text{C}$)	$I_D (100^\circ\text{C})$	58	A
Pulsed Drain Current	I_{DM}	320	A
Power Dissipation	P_D	85	W
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	1.47	$^\circ\text{C/W}$
Single pulse avalanche energy	E_{AS}	400	mJ
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55 ~ +150	$^\circ\text{C}$

Electrical characteristics ($T_A=25^\circ\text{C}$, unless otherwise noted)

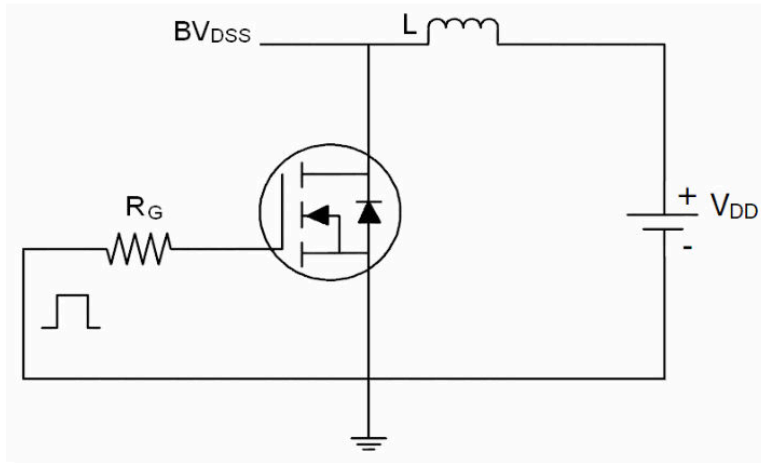
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu\text{A}$	60			V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 60V, V_{GS} = 0V$			1	μA
Gate-body leakage current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			±100	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	1.0		2.4	V
Drain-source on-resistance ¹⁾	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 40A$			4	m Ω
		$V_{GS} = 4.5V, I_D = 40A$			5	
Forward transconductance ¹⁾	g_{FS}	$V_{DS} = 10V, I_D = 40A$	40			S
Dynamic characteristics²⁾						
Input Capacitance	C_{iss}	$V_{DS} = 30V, V_{GS} = 0V, f = 1\text{MHz}$		4000		pF
Output Capacitance	C_{oss}			680		
Reverse Transfer Capacitance	C_{rss}			23		
Total Gate Charge	Q_g	$V_{DS} = 30V, V_{GS} = 10V, I_D = 40A$		67		nC
Gate-Source Charge	Q_{gs}			12		
Gate-Drain Charge	Q_{gd}			8.5		
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 30V, V_{GS} = 10V, I_D = 40A, R_{GEN} = 4.7\Omega$		11		nS
Turn-on rise time	t_r			5		
Turn-off delay time	$t_{d(off)}$			56		
Turn-off fall time	t_f			12		
Source-Drain Diode characteristics						
Diode Forward Current ¹⁾	I_S				80	A
Diode Forward voltage	V_{DS}	$V_{GS} = 0V, I_S = 40A$			1.2	V
Reverse Recovery Time	t_{rr}	$T_J = 25^\circ\text{C}, I_F = I_S, di/dt = 100A/\mu\text{s}$ ¹⁾		48		nS
Reverse Recovery Charge	Q_{rr}			60		nC

Notes:

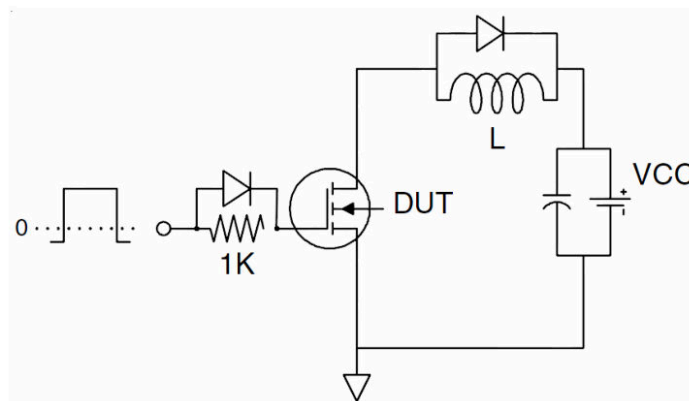
- 1) Pulse Test: Pulse Width < 300 μs , Duty Cycle $\leq 2\%$.
- 2) Guaranteed by design, not subject to production testing.

Test Circuit

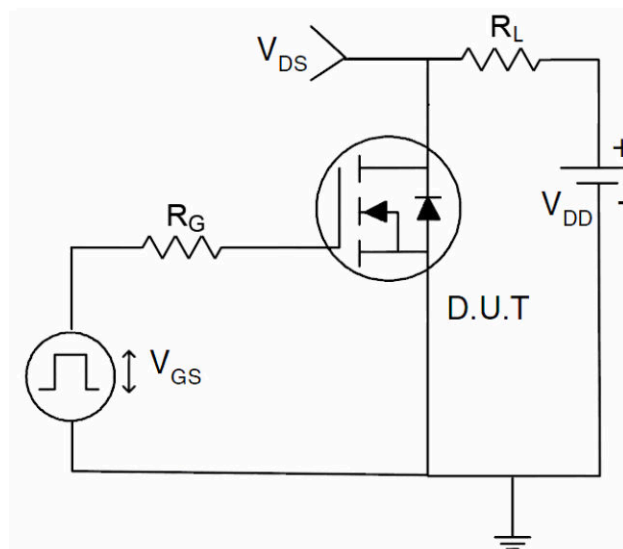
1) E_{AS} test Circuit



2) Gate charge test Circuit



3) Switch Time Test Circuit



Typical Characteristics

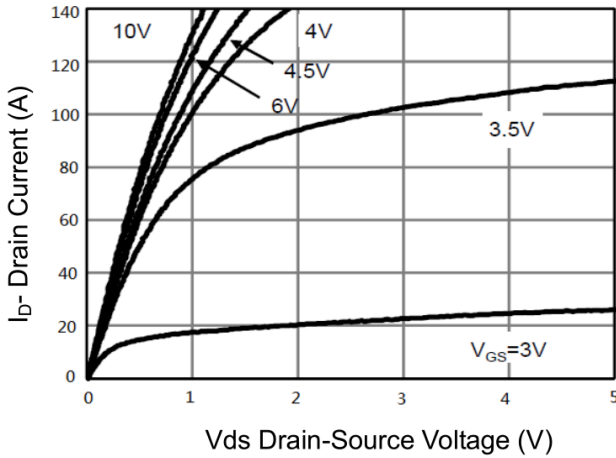


Figure 1 Output Characteristics

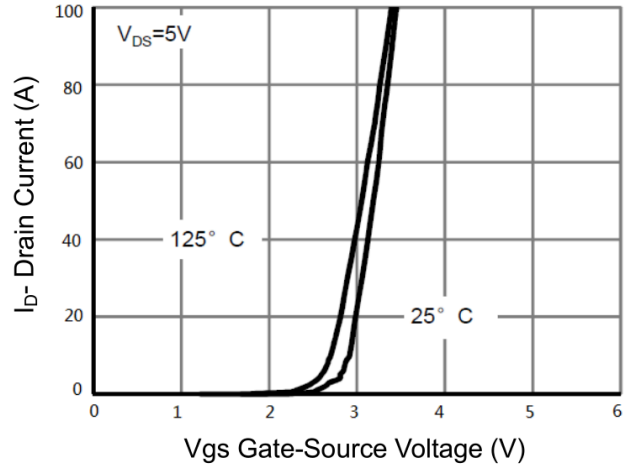


Figure 2 Transfer Characteristics

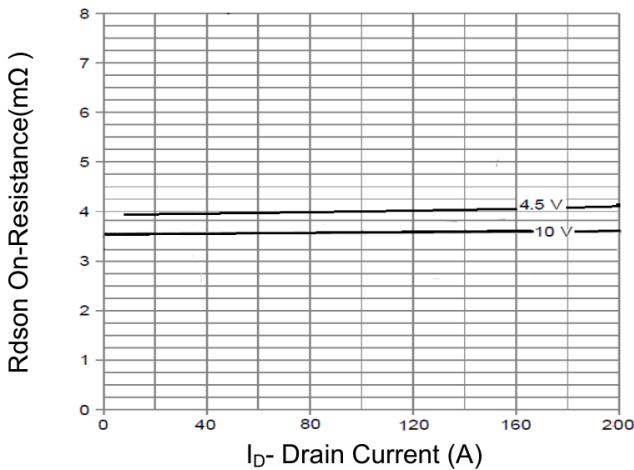


Figure 3 Rdson- Drain Current

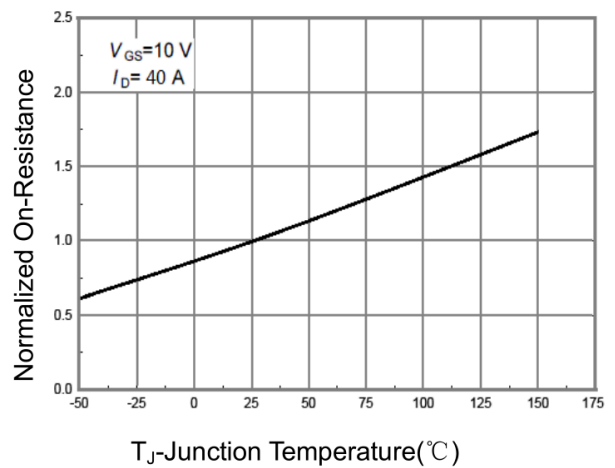


Figure 4 Rdson-Junction Temperature

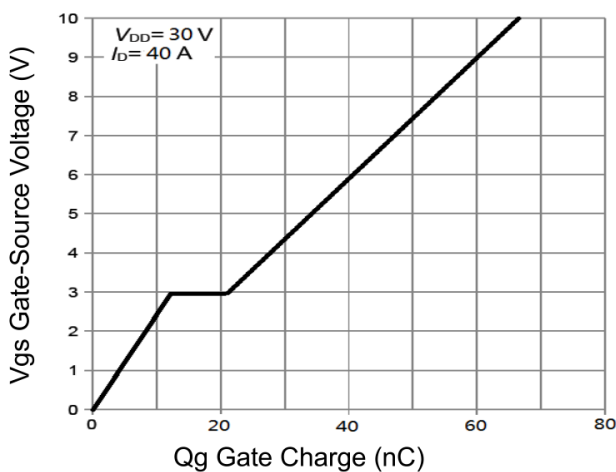


Figure 5 Gate Charge

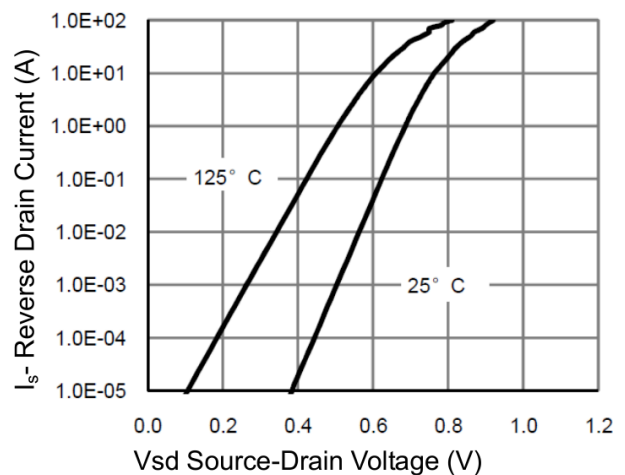


Figure 6 Source- Drain Diode Forward

Typical Characteristics

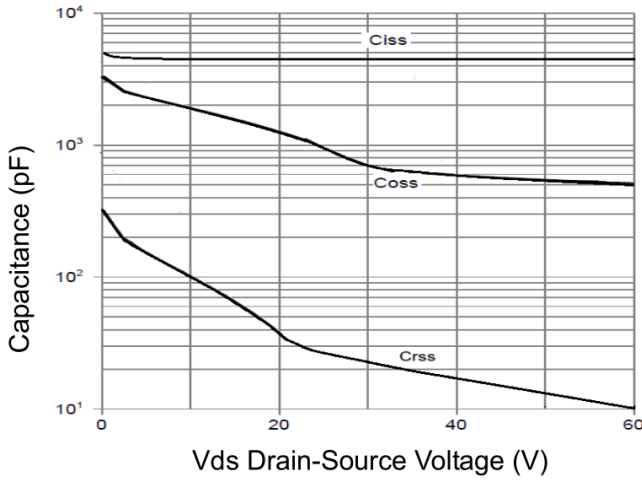


Figure 7 Capacitance vs Vds

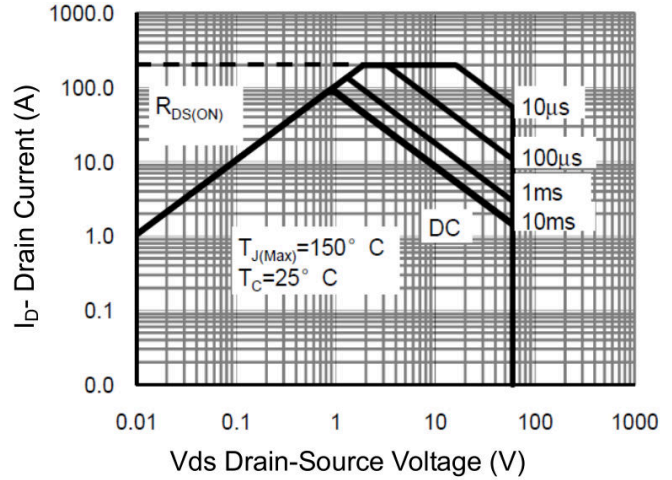


Figure 8 Safe Operation Area

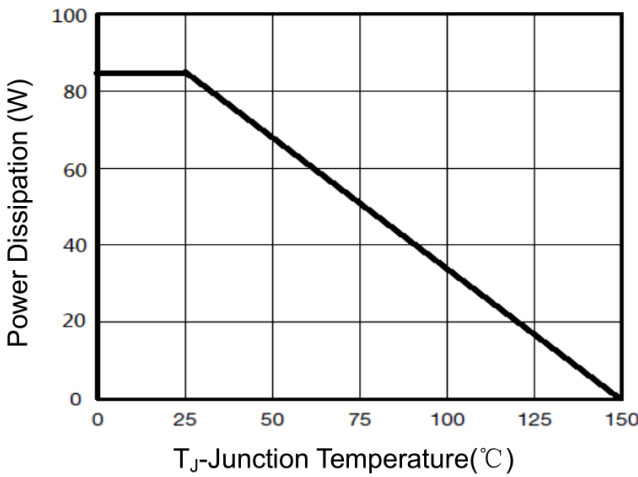


Figure 9 Power De-rating

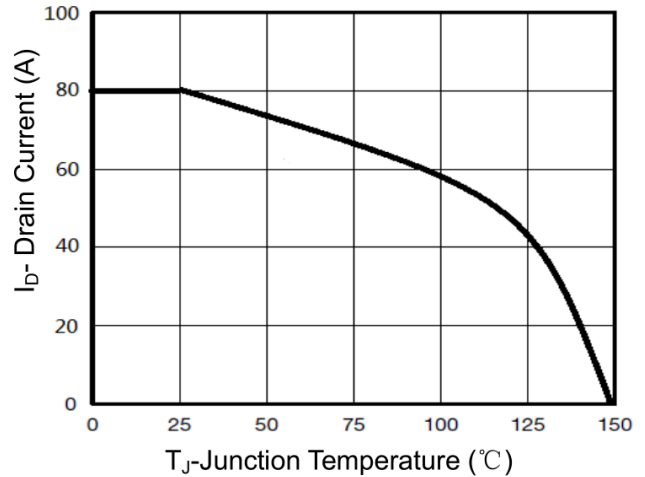


Figure 10 Current De-rating

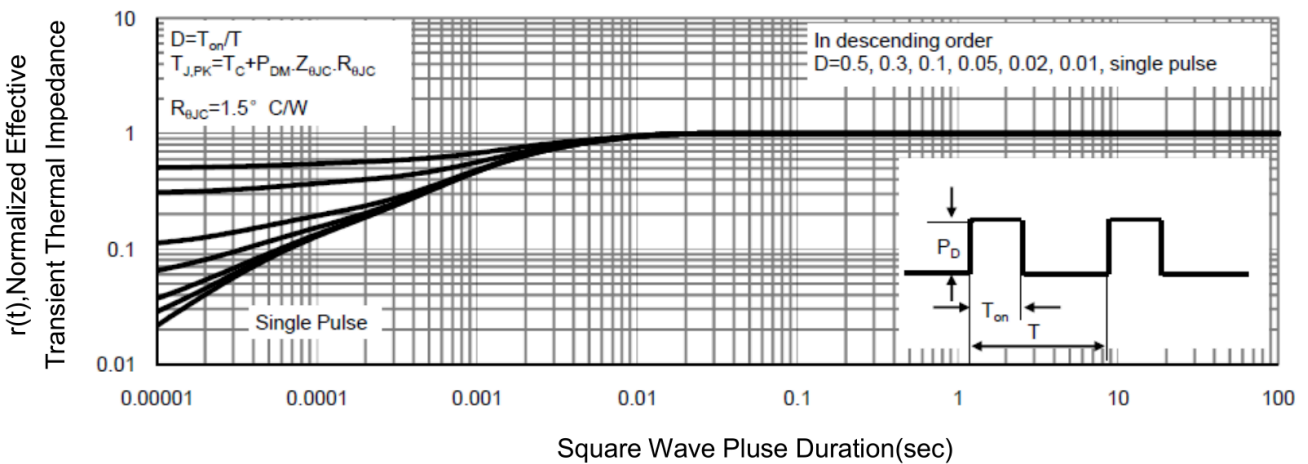
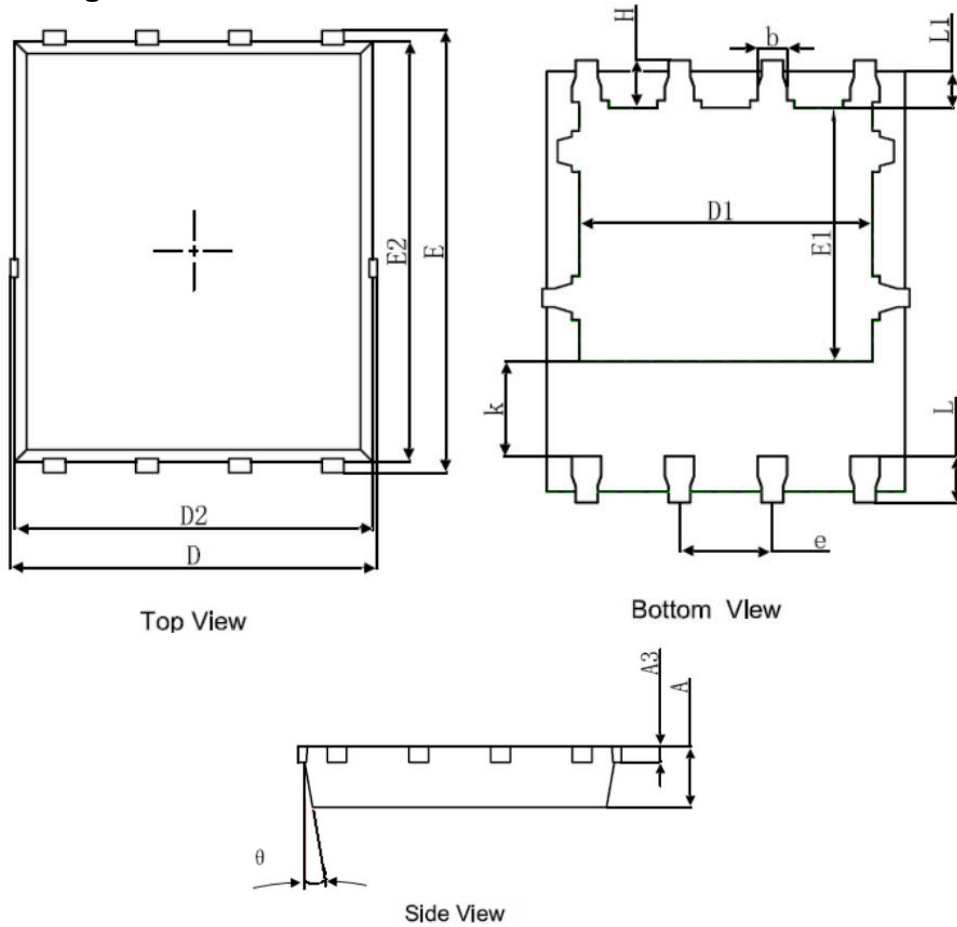


Figure 11 Normalized Maximum Transient Thermal Impedance

DFN5X6-8L Package Information



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°