

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
-30V	7mΩ@-10V	-50A

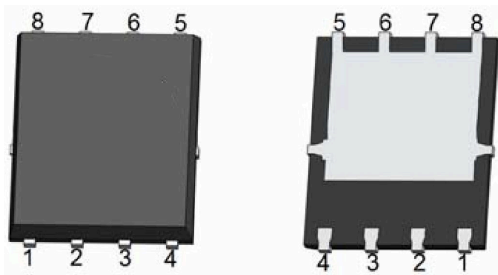
Feature

- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high E_{AS}
- Suffix "-Q1" for AEC-Q101

Application

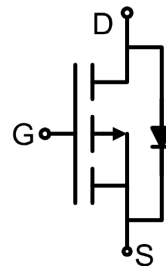
- Battery and loading switching

Package

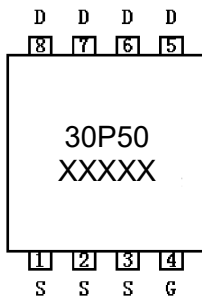


DFN5X6-8L

Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	-50	A
Pulsed Drain Current	I_{DM}	-200	A
Power Dissipation	P_D	35	W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	3.6	$^{\circ}C/W$
Single pulse avalanche energy	E_{AS}	300	mJ
Junction Temperature	T_J	150	$^{\circ}C$
Storage Temperature	T_{STG}	-55 ~ +150	$^{\circ}C$

Electrical characteristics (T_A=25 °C, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-30			V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = -30V, V_{GS} = 0V$			-1	μA
Gate-body leakage current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 100	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1.0		-2.2	V
Drain-source on-resistance ¹⁾	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -10A$		4.4	7	m Ω
Forward transconductance ¹⁾	g_{FS}	$V_{DS} = -10V, I_D = -15A$		20		S
Dynamic characteristics²⁾						
Input Capacitance	C_{iss}	$V_{DS} = -15V, V_{GS} = 0V, f = 1MHz$		3590		pF
Output Capacitance	C_{oss}			695		
Reverse Transfer Capacitance	C_{rss}			665		
Total Gate Charge	Q_g	$V_{DS} = -15V, V_{GS} = -10V, I_D = -10A$		84		nC
Gate-Source Charge	Q_{gs}			11.7		
Gate-Drain Charge	Q_{gd}			25		
Turn-on delay time	$t_{d(on)}$	$V_{DD} = -15V, V_{GS} = -10V, I_D = -10A, R_{GEN} = 6\Omega$		13		nS
Turn-on rise time	t_r			12		
Turn-off delay time	$t_{d(off)}$			50		
Turn-off fall time	t_f			14		
Source-Drain Diode characteristics						
Diode Forward Current ¹⁾	I_S				-50	A
Diode Forward voltage	V_{DS}	$V_{GS} = 0V, I_S = -10A$			-1.2	V
Reverse Recovery Time	t_{rr}	$T_J = 25^{\circ}C, I_F = -10A, di/dt = 100A/\mu s$ ¹⁾			45	nS
Reverse Recovery Charge	Q_{rr}				43	nC

Notes:

1) Pulse Test: Pulse Width < 300 μs , Duty Cycle $\leq 2\%$.

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

Typical Characteristics

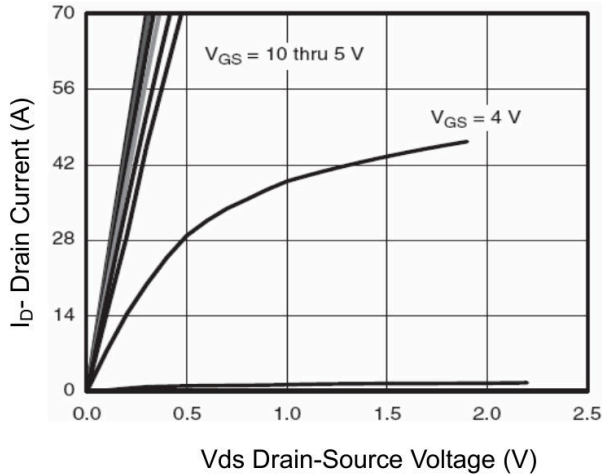


Figure 1 Output Characteristics

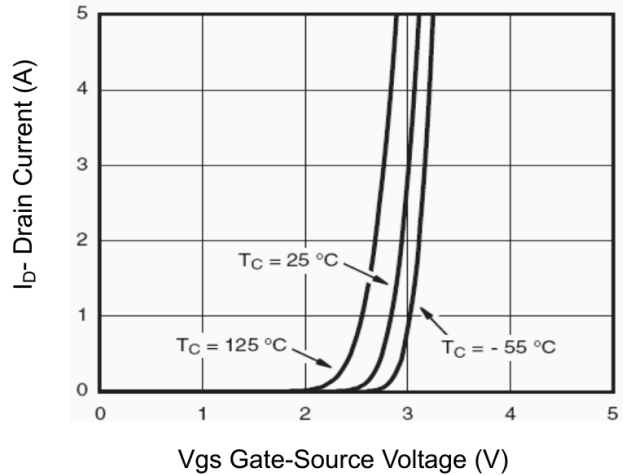


Figure 2 Transfer Characteristics

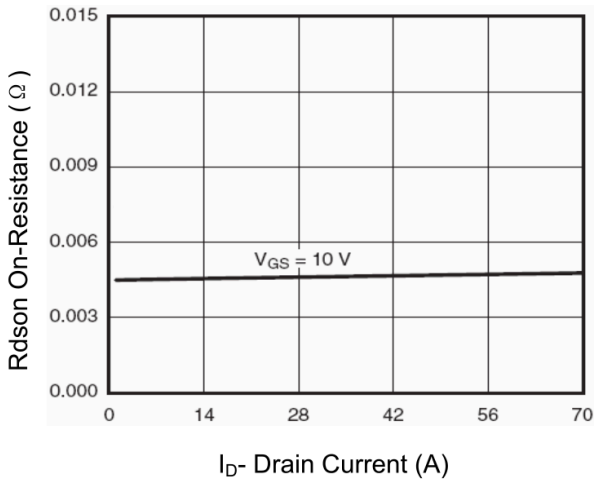


Figure 3 Rdson- Drain Current

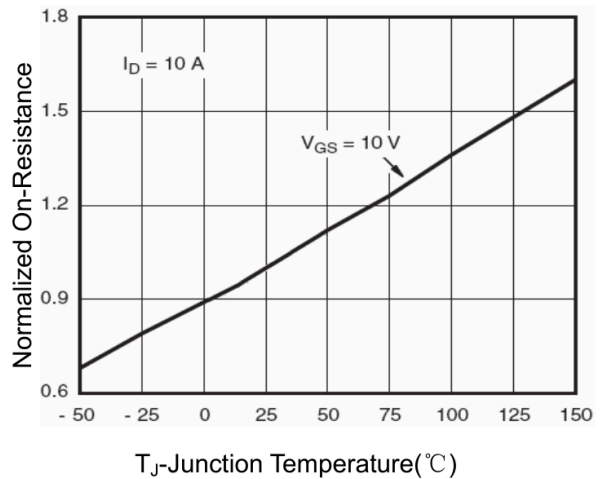


Figure 4 Rdson-Junction Temperature

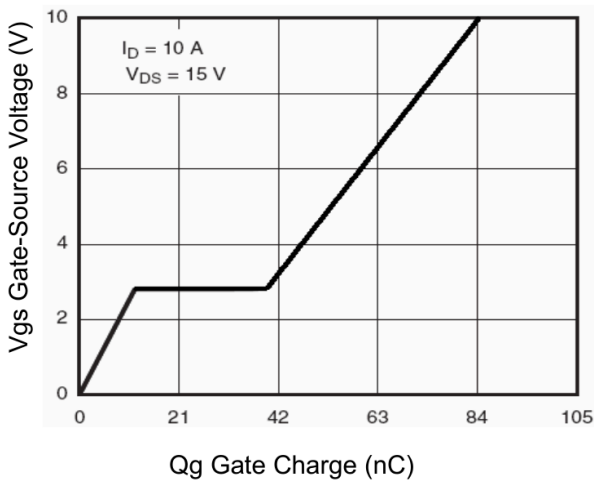


Figure 5 Gate Charge

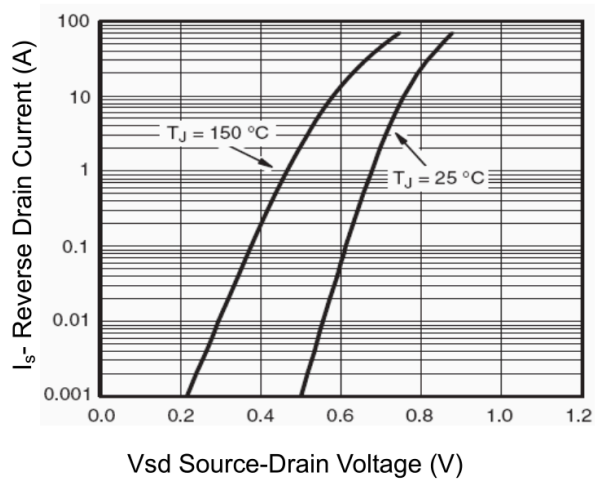
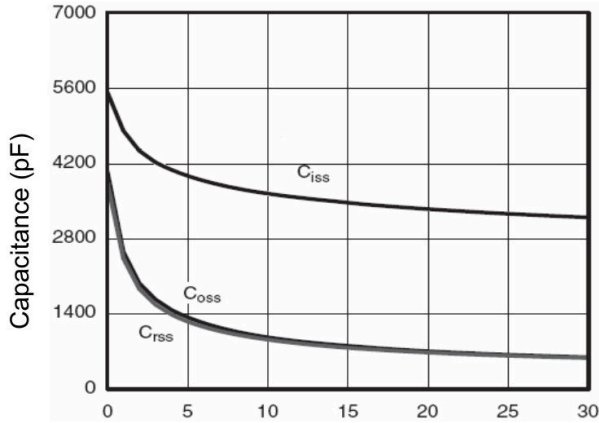
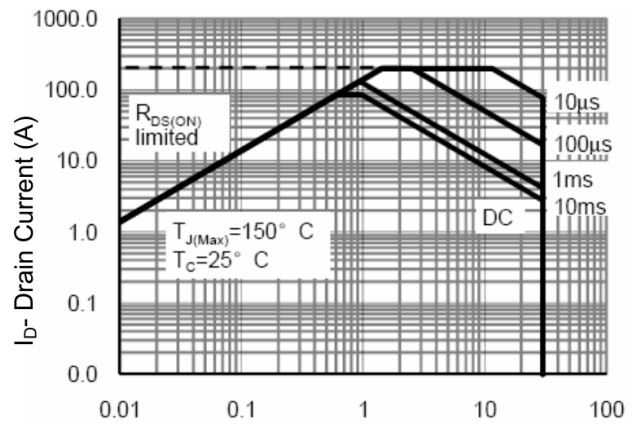


Figure 6 Source- Drain Diode Forward

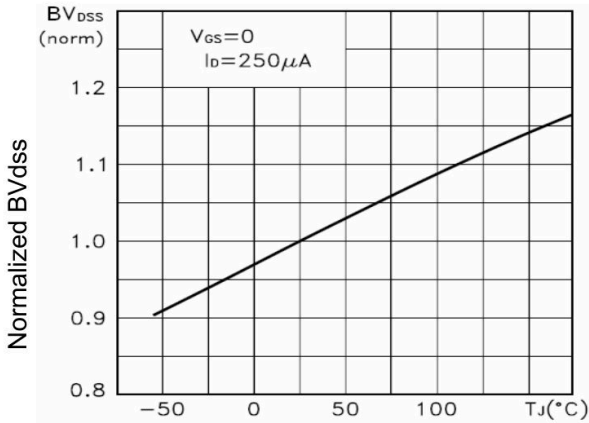
Typical Characteristics



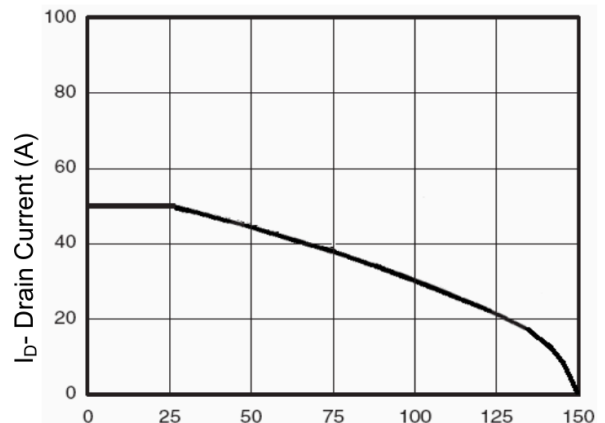
Vds Drain-Source Voltage (V)
Figure 7 Capacitance vs Vds



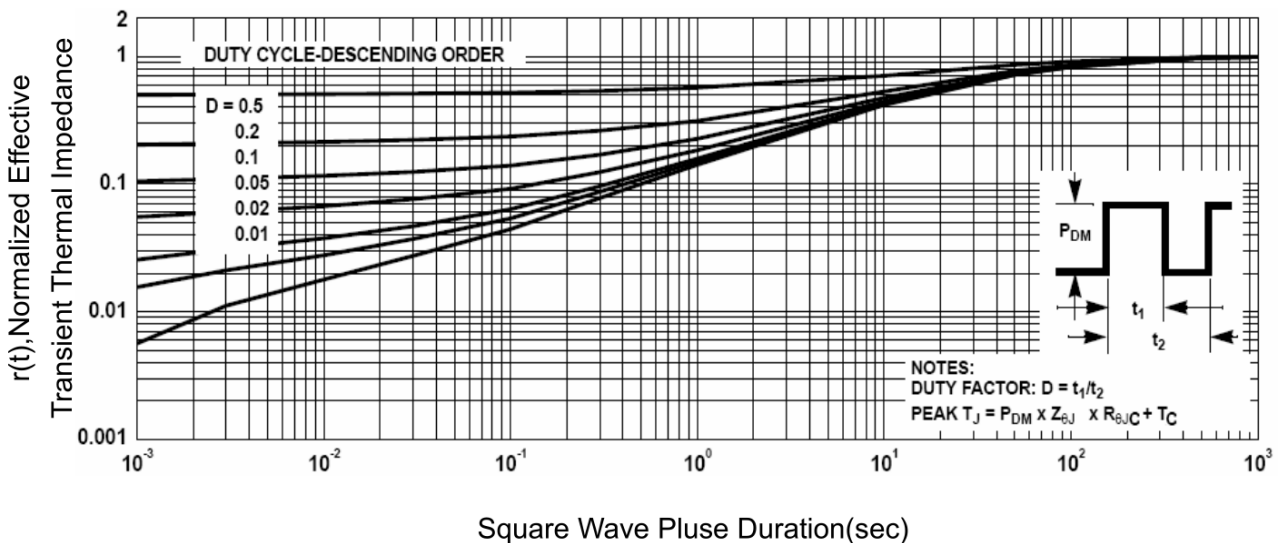
Vds Drain-Source Voltage (V)
Figure 8 Safe Operation Area



T_J-Junction Temperature(°C)
Figure 9 BV_{DSS} vs Junction Temperature

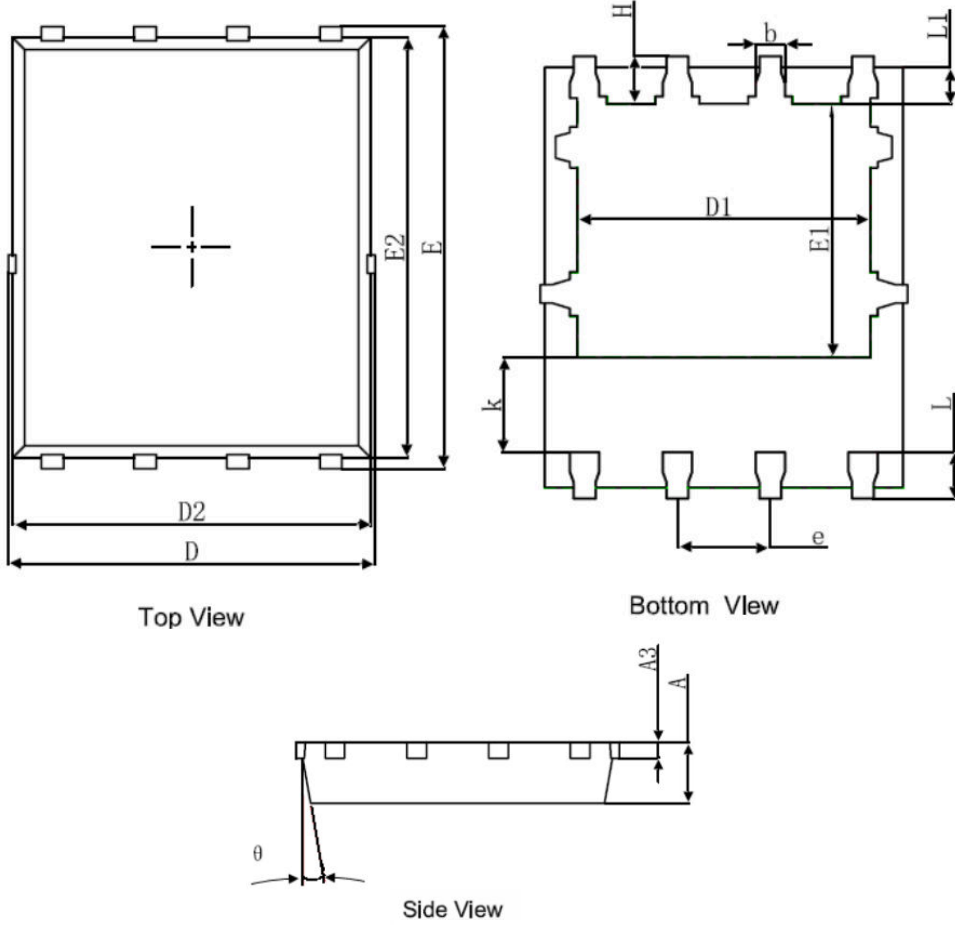


T_J-Junction Temperature(°C)
Figure 10 ID Current Derating vs Junction



Square Wave Pulse Duration(sec)
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°