

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
60V	11m Ω @10V	45A
	16m Ω @4.5V	

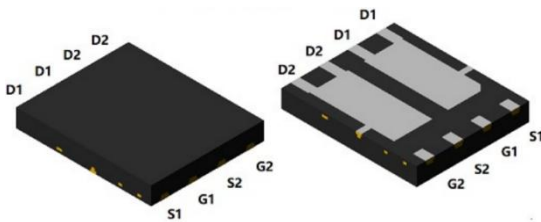
Feature

- High density cell design for ultra low R_{dson}
- Very low on-resistance $R_{DS(on)}$
- Good stability and uniformity with high E_{AS}
- Suffix "-Q1" for AEC-Q101

Application

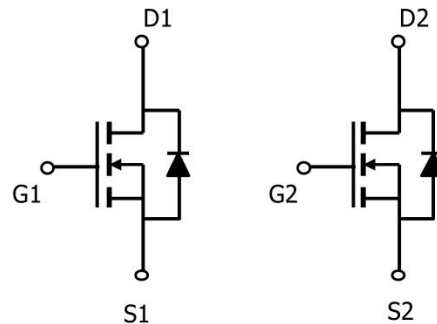
- DC/DC Converter
- Ideal for high-frequency switching and synchronous rectification

Package



DFN5X6-8L

Circuit diagram



Marking



Absolute maximum ratings (T_c=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	I _D	45	A
Drain Current-Continuous(T _c =100°C)	I _D (100°C)	32	A
Pulsed Drain Current	I _{DM}	140	A
Power Dissipation	P _D	60	W
Thermal Resistance,Junction-to-Case	R _{θJC}	2.08	°C/W
Single pulse avalanche energy ³⁾	E _{AS}	260	mJ
Junction Temperature	T _J	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	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} =±20V, V _{DS} = 0V			±100	nA
Gate threshold voltage ¹⁾	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.2	1.9	2.5	V
Drain-source on-resistance ¹⁾	R _{DS(on)}	V _{GS} =10V, I _D =20A		9.4	11	mΩ
		V _{GS} =4.5V, I _D =20A		13.4	16	
Forward transconductance	g _{FS}	V _{DS} =5V, I _D =20A	25			S
Dynamic characteristics²⁾						
Input Capacitance	C _{iss}	V _{DS} =30V, V _{GS} =0V, f =1MHz		2750		pF
Output Capacitance	C _{oss}			170		
Reverse Transfer Capacitance	C _{rss}			152		
Total Gate Charge	Q _g	V _{DS} =30V, V _{GS} =10V, I _D =20A		60		nC
Gate-Source Charge	Q _{gs}			10		
Gate-Drain Charge	Q _{gd}			14		
Turn-on delay time	t _{d(on)}	V _{DD} =30V, V _{GS} =10V, R _L =1.5Ω, R _{GEN} =3Ω		9		nS
Turn-on rise time	t _r			7		
Turn-off delay time	t _{d(off)}			32		
Turn-off fall time	t _f			6		
Source-Drain Diode characteristics						
Diode Forward Current	I _S				45	A
Diode Forward voltage ¹⁾	V _{DS}	V _{GS} =0V, I _S =20A			1.2	V
Reverse Recovery Time	t _{rr}	T _J = 25°C, I _F =20A di/dt = 100A/μs ¹⁾		31		nS
Reverse Recovery Charge	Q _{rr}			45		nC

Notes:

- 1) Pulse Test: Pulse Width < 300μs, Duty Cycle ≤2%.
- 2) Guaranteed by design, not subject to production testing.
- 3) EAS condition : T_j=25°C, V_{DD}=30V, V_G=10V, L=0.5mH, R_g=25Ω

Typical Characteristics

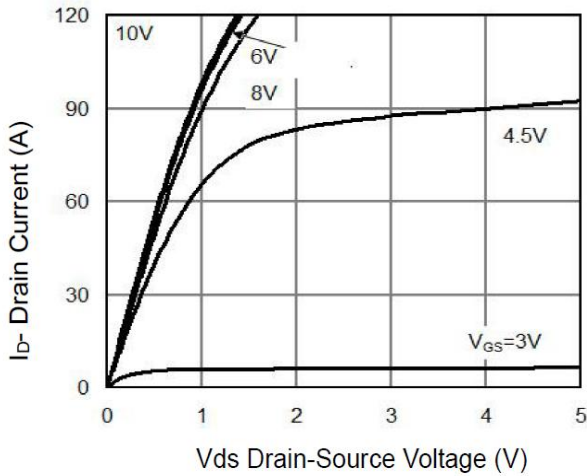


Figure 1 Output Characteristics

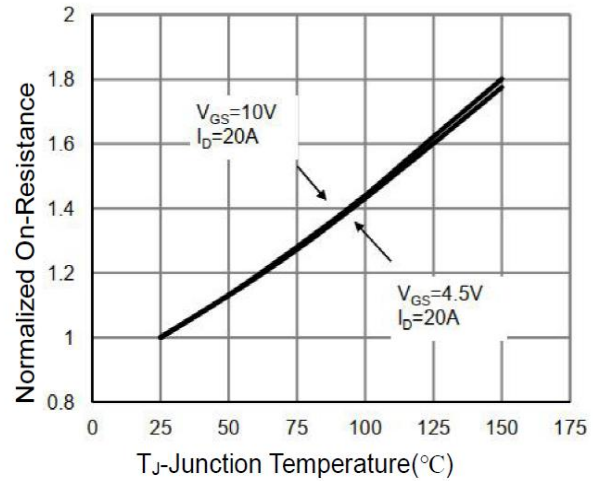


Figure 2 Rdson-Junction Temperature

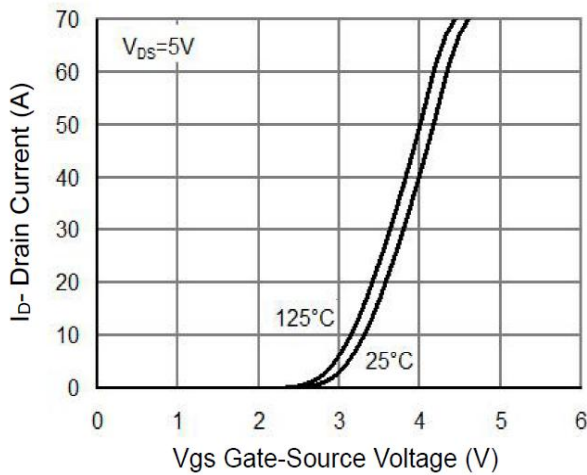


Figure 3 Transfer Characteristics

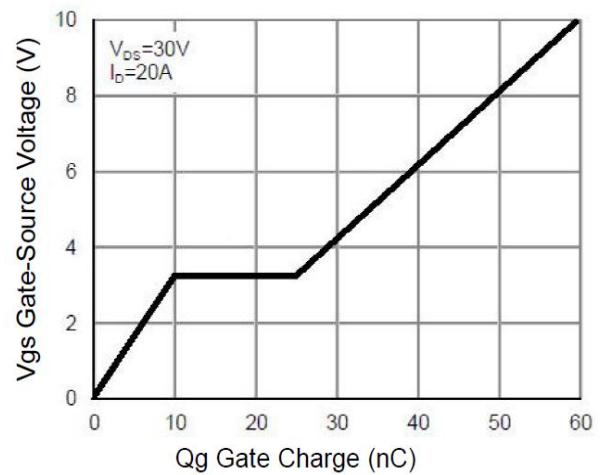


Figure 4 Gate Charge

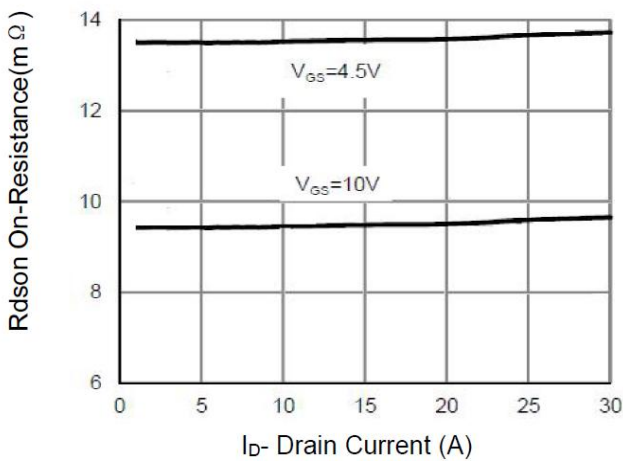


Figure 5 Rdson- Drain Current

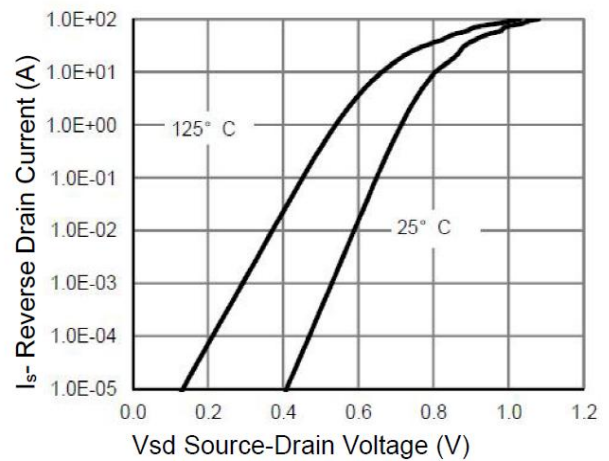


Figure 6 Source- Drain Diode Forward

Typical Characteristics

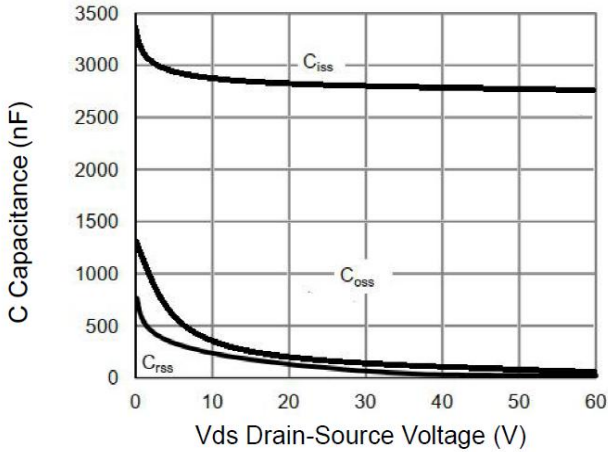


Figure 7 Capacitance vs Vds

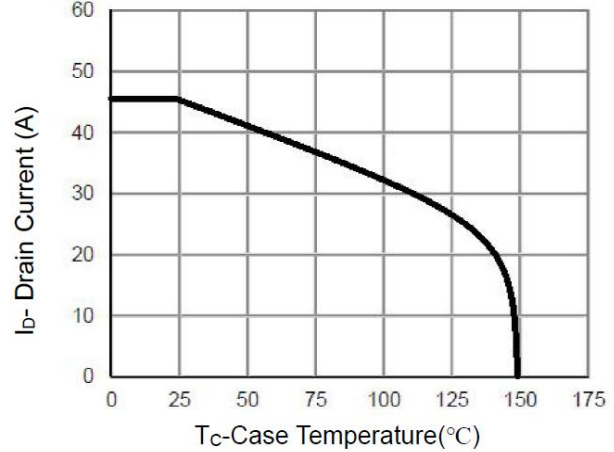


Figure 8 Current De-rating

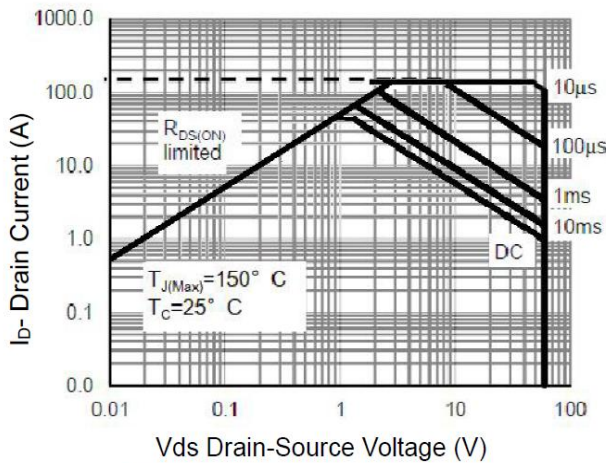


Figure 9 Safe Operation Area

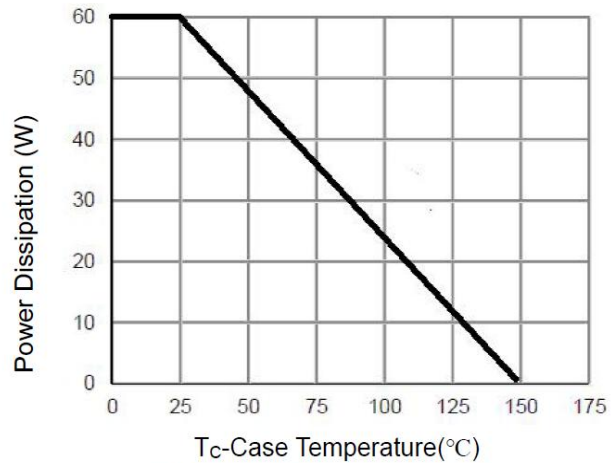


Figure 10 Power De-rating

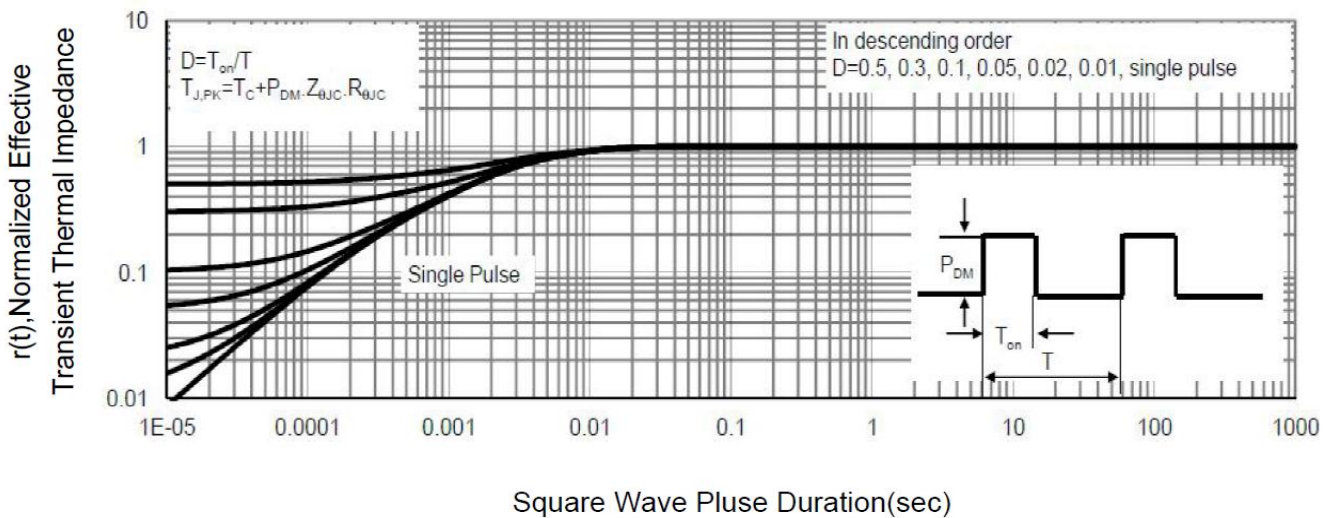
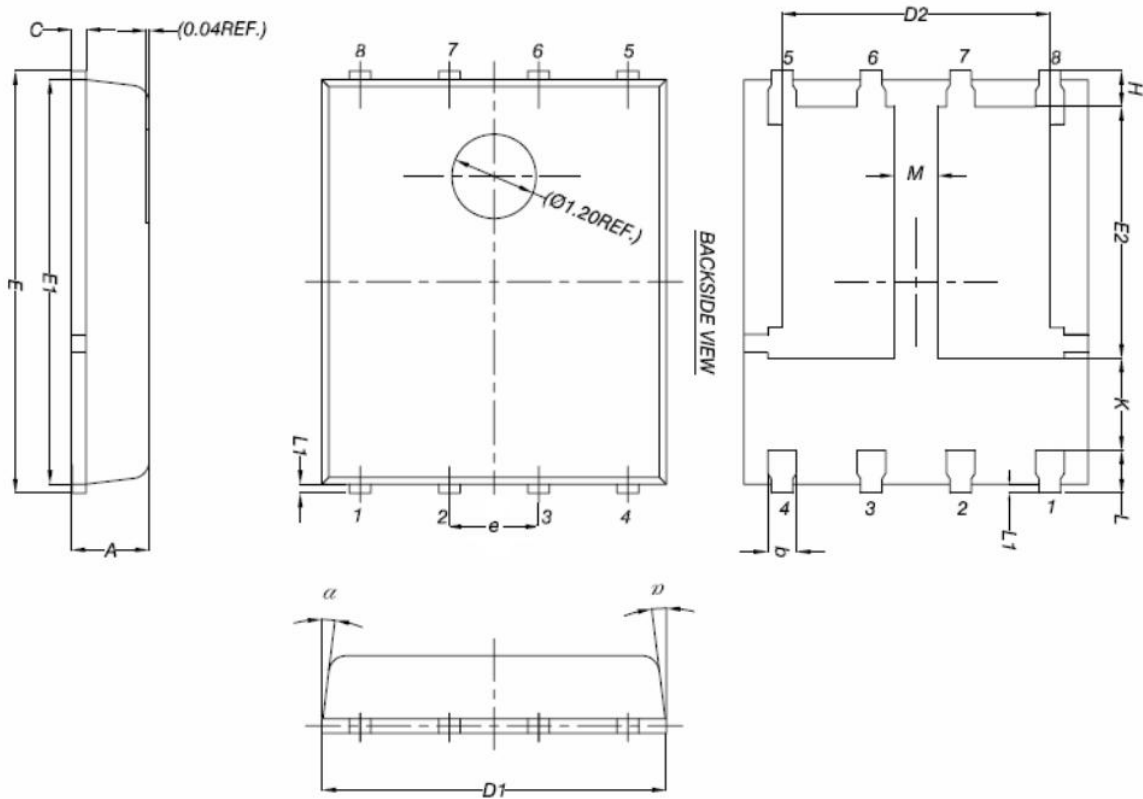


Figure 11 Normalized Maximum Transient Thermal Impedance

DFN5X6-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.100	0.035	0.043
b	0.330	0.510	0.013	0.020
C	0.200	0.300	0.008	0.012
D1	4.800	5.000	0.188	0.197
D2	3.610	3.960	0.142	0.156
E	5.900	6.100	0.232	0.240
E1	5.700	5.800	0.224	0.228
E2	3.380	3.780	0.133	0.149
e	1.270 BSC		0.050 BSC	
H	0.410	0.610	0.016	0.024
K	1.100	-	0.043	-
L	0.510	0.710	0.020	0.028
L1	0.060	0.200	0.002	0.008
M	0.500	-	0.019	-
α	0°	12°	0°	12°