

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_b
40V	2.8mΩ@10V	110A
	3.9mΩ@4.5V	

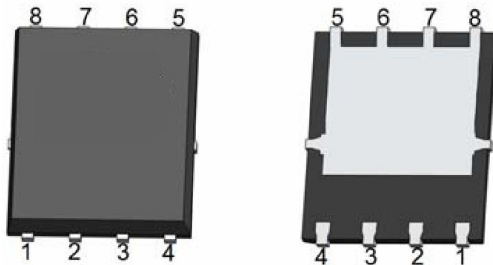
Feature

- Excellent package for heat dissipation
- Very low on-resistance $R_{DS(on)}$
- Suffix "-Q1" for AEC-Q101

Application

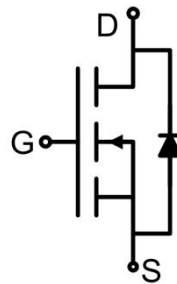
- DC/DC converter
- Idea for high-frequency switching and synchronous rectification

Package

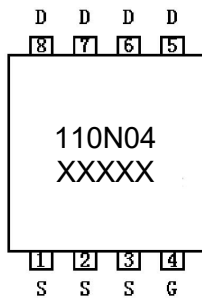


DFN5X6-8L

Circuit diagram



Marking



Absolute maximum ratings (Ta=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	110	A
Continuous Drain Current(T _C =100°C)	I _D (100°C)	77.8	A
Pulsed Drain Current	I _{DM}	340	A
Power Dissipation	P _D	75	W
Thermal Resistance,Junction-to-Case	R _{θJC}	1.67	°C/W
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	40			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =40V, V _{GS} = 0V			1	μA
Gate-body leakage current	I _{GSS}	V _{GS} =±20V, V _{DS} = 0V			±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.2	1.7	2.2	V
Drain-source on-resistance ¹⁾	R _{DS(on)}	V _{GS} =10V, I _D =55A		2.4	2.8	mΩ
		V _{GS} =4.5V, I _D =55A		3.3	3.9	
Forward transconductance ¹⁾	g _{FS}	V _{DS} =5V, I _D =55A		60		S
Dynamic characteristics²⁾						
Input Capacitance	C _{iss}	V _{DS} =20V, V _{GS} =0V, f =1MHz		3510		pF
Output Capacitance	C _{oss}			860		
Reverse Transfer Capacitance	C _{rss}			60		
Total Gate Charge	Q _g	V _{DS} =20V, V _{GS} =10V, I _D =55A		60		nC
Gate-Source Charge	Q _{gs}			9.9		
Gate-Drain Charge	Q _{gd}			9.5		
Turn-on delay time	t _{d(on)}	V _{DD} =20V, V _{GS} =10V, I _D =55A, R _{GEN} =1.6Ω		10.5		nS
Turn-on rise time	t _r			4		
Turn-off delay time	t _{d(off)}			35		
Turn-off fall time	t _f			5		
Source-Drain Diode characteristics						
Diode Forward Current ¹⁾	I _S				110	A
Diode Forward voltage	V _{DS}	V _{GS} =0V, I _S =55A			1.2	V
Reverse Recovery Time	t _{rr}	T _J = 25°C, I _F =I _S di/dt = 100A/μs ¹⁾		24		nS
Reverse Recovery Charge	Q _{rr}			68		nC

Notes:

1) Pulse Test: Pulse Width < 300μs, Duty Cycle ≤2%.

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

Typical Characteristics

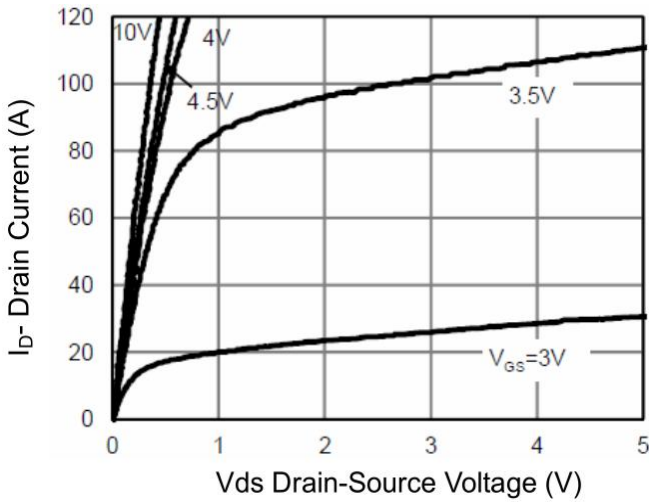


Figure 1 Output Characteristics

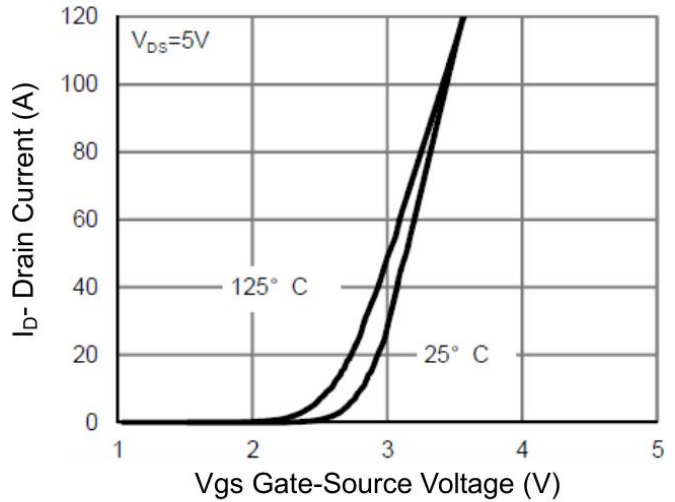


Figure 2 Transfer Characteristics

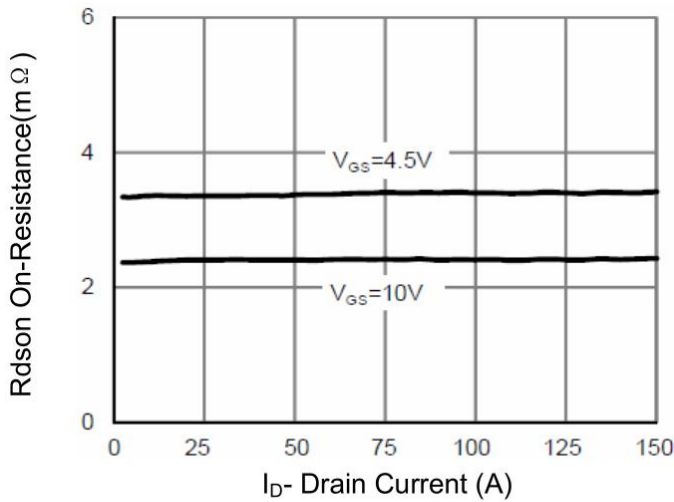


Figure 3 Rdson- Drain Current

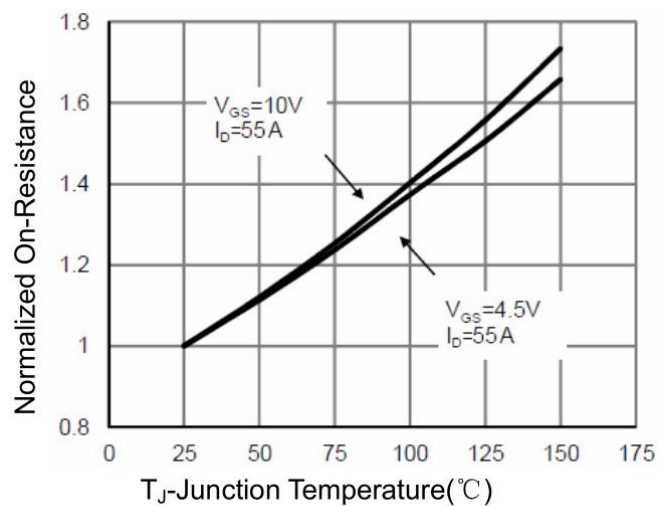


Figure 4 Rdson-Junction Temperature

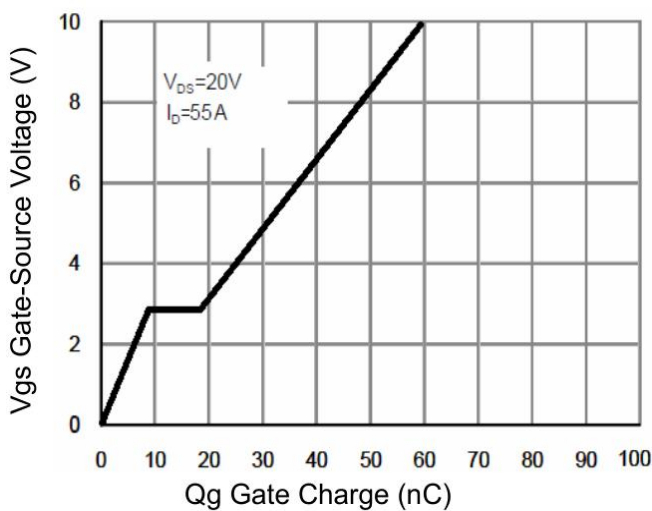


Figure 5 Gate Charge

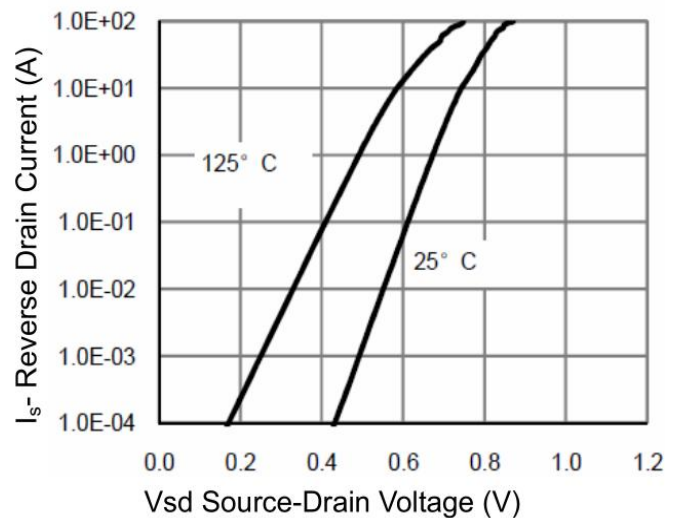


Figure 6 Source- Drain Diode Forward

Typical Characteristics

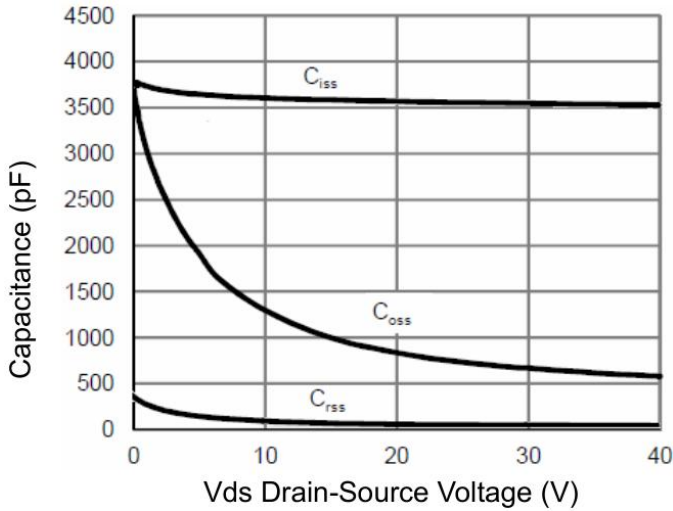


Figure 7 Capacitance vs Vds

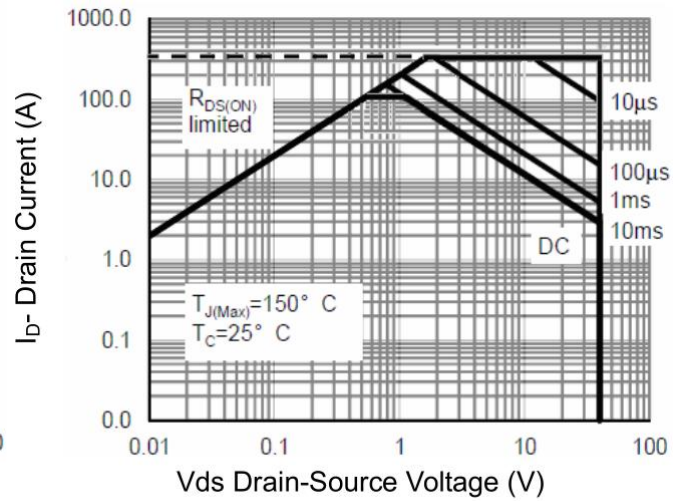


Figure 8 Safe Operation Area

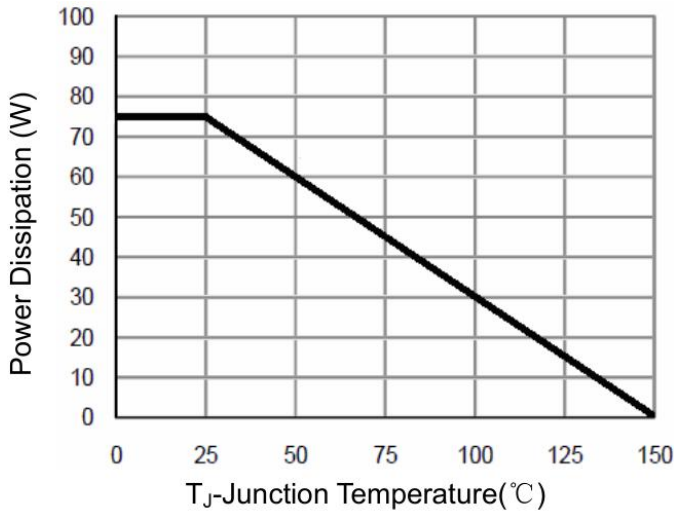


Figure 9 Power De-rating

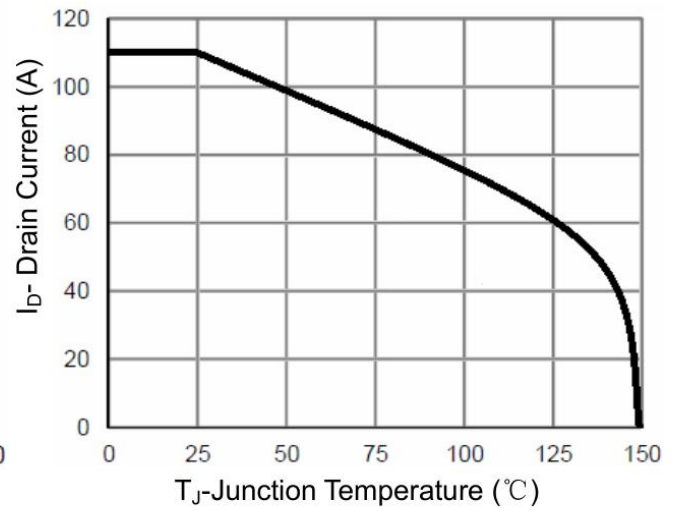


Figure 10 Current De-rating

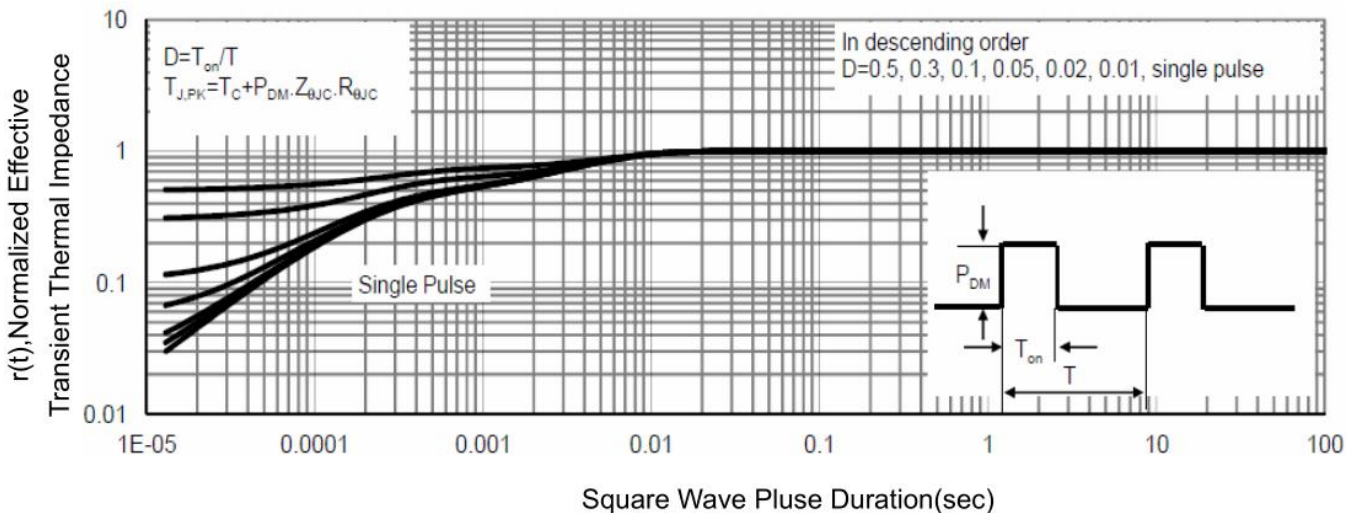
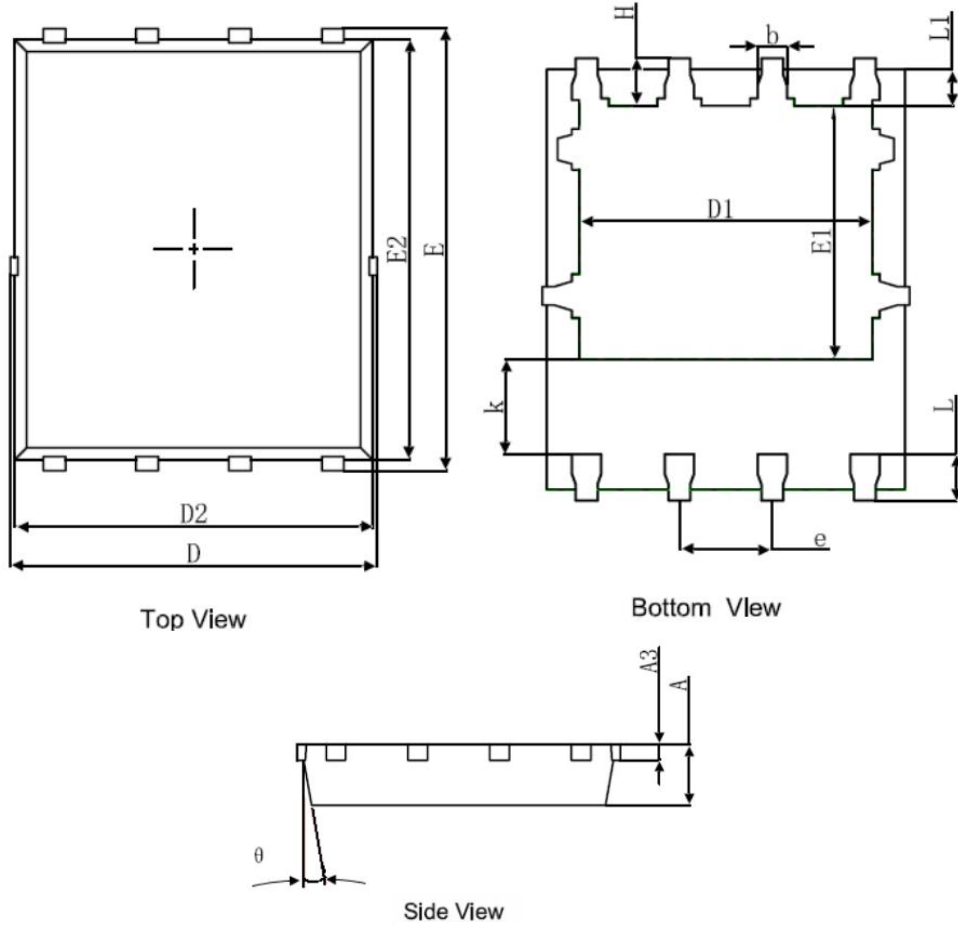


Figure 11 Normalized Maximum Transient Thermal Impedance

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°