

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
-40V	3.5mΩ@-10V	-150A
	6.0mΩ@-4.5V	

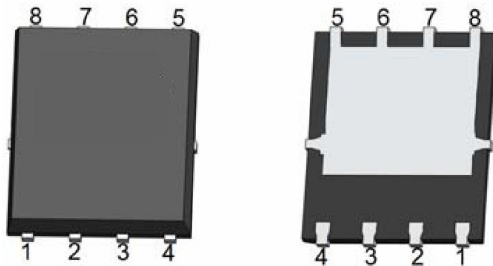
Feature

- High density cell design for low Rdson
- Split gate trench MOSFET technology
- Excellent gate charge x Rdson product(FOM)
- Suffix "-Q1" for AEC-Q101

Application

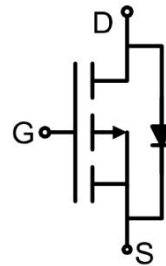
- Automotive Systems
- DC/DC Converter

Package

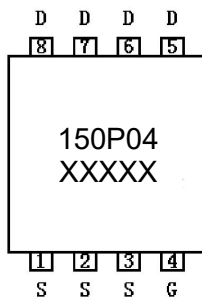


DFN5X6-8L

Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	-40	V
Gate-Source Voltage	V _{GS}	±20	V
Continuous Drain Current	I _D	-150	A
Continuous Drain Current(T _c =100°C)	I _D (100°C)	-120	A
Pulsed Drain Current	I _{DM}	-600	A
Power Dissipation	P _D	150	W
Thermal Resistance,Junction-to-Case	R _{θJC}	0.83	°C/W
Single pulse avalanche energy	E _{AS}	1076	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	-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	-0.8		-1.8	V
Drain-source on-resistance ¹⁾	R _{DS(on)}	V _{GS} = -10V, I _D = -75A		2.8	3.5	mΩ
		V _{GS} = -4.5V, I _D = -75A		3.9	6.0	mΩ
Gate resistance	R _G	F=1.0MHz		5.5		Ω
Forwad Transconductance	g _{FS}	V _{DS} = -5V, I _D = -75A		30		S
Dynamic characteristics²⁾						
Input Capacitance	C _{iss}	V _{DS} = -20V, V _{GS} = 0V, f = 1MHz		8940		pF
Output Capacitance	C _{oss}			1900		
Reverse Transfer Capacitance	C _{rss}			45		
Total Gate Charge	Q _g	V _{DS} = -20V, V _{GS} = -10V, I _D = -75A		104.4		nC
Gate-Source Charge	Q _{gs}			20.8		
Gate-Drain Charge	Q _{gd}			13.5		
Turn-on delay time	t _{d(on)}	V _{DD} = -20V, V _{GS} = -10V, I _D = -75A, R _{GEN} = 1.6Ω		18		nS
Turn-on rise time	t _r			13		
Turn-off delay time	t _{d(off)}			90		
Turn-off fall time	t _f			15		
Source-Drain Diode characteristics						
Diode Forward Current ¹⁾	I _S				-150	A
Diode Forward voltage	V _{SD}	V _{GS} = 0V, I _S = -75A			-1.2	V
Reverse Recovery Time	t _{rr}	T _J = 25°C, I _F = -75A		35		nS
Reverse Recovery Charge	Q _{rr}	di/dt = 100A/μs ¹⁾		85		nC

Notes:

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

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

Typical Characteristics

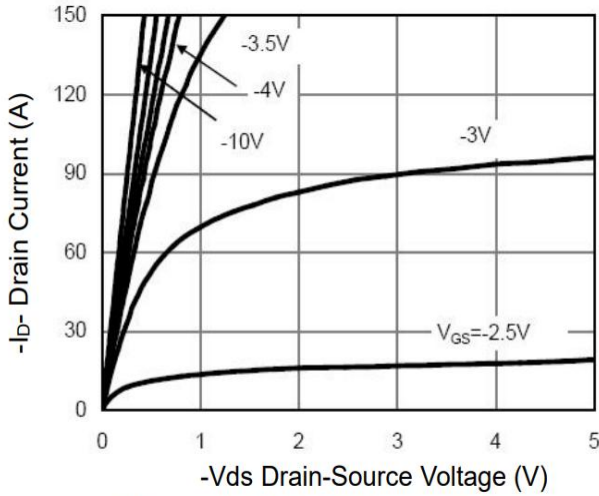


Figure 1 Output Characteristics

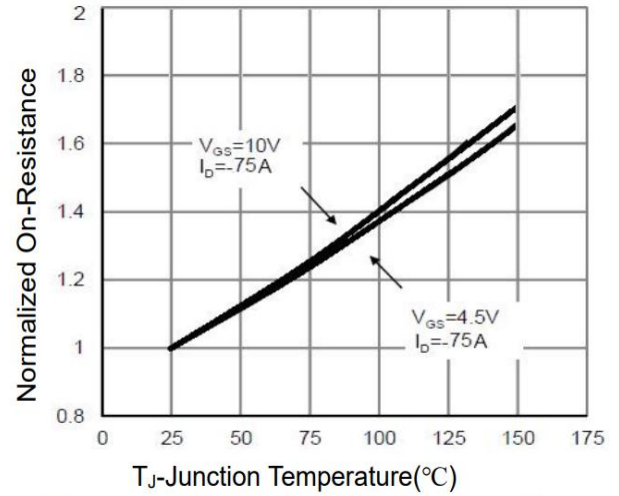


Figure 2 Rdson-Junction Temperature

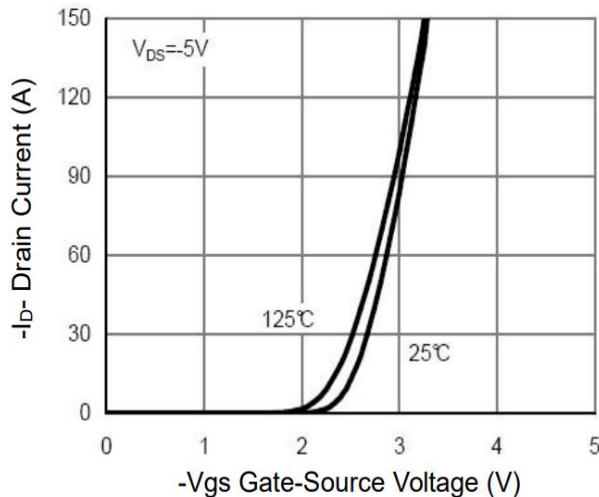


Figure 3 Transfer Characteristics

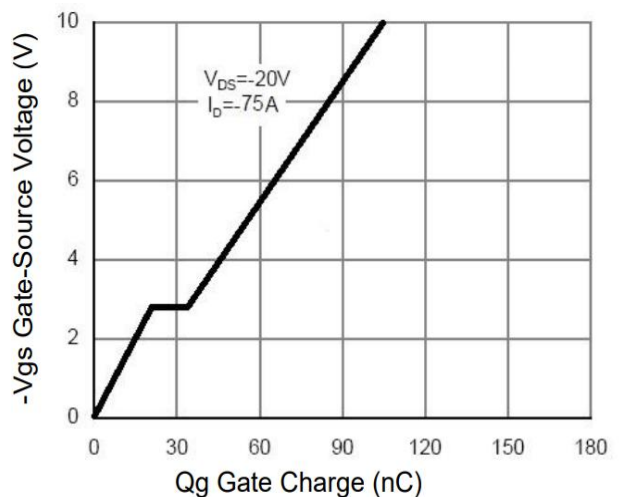


Figure 4 Gate Charge

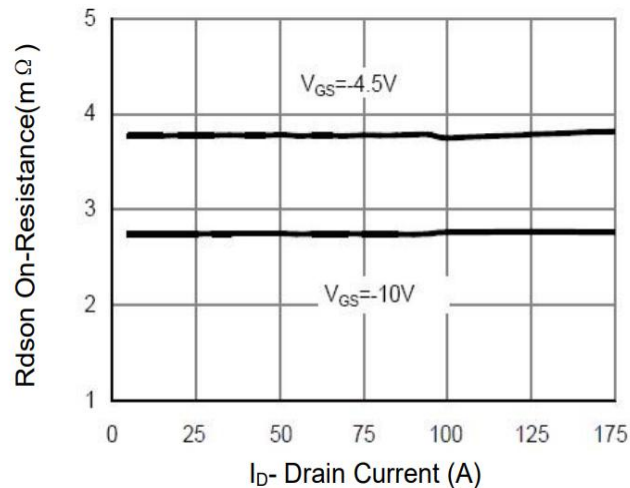


Figure 5 Rdson- Drain Current

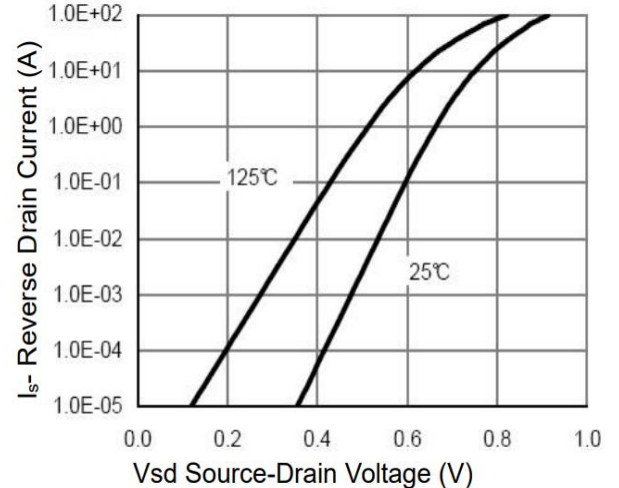


Figure 6 Source- Drain Diode Forward

Typical Characteristics

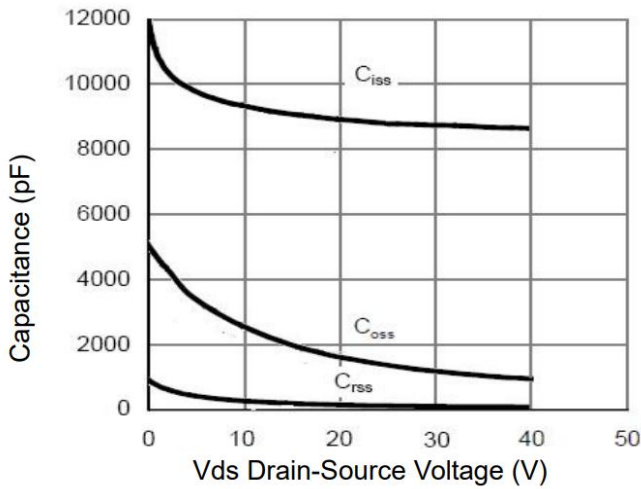


Figure 7 Capacitance vs Vds

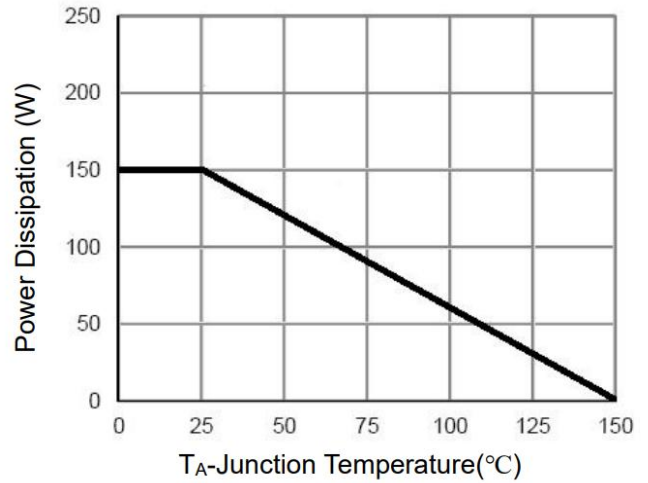


Figure 8 Power De-rating

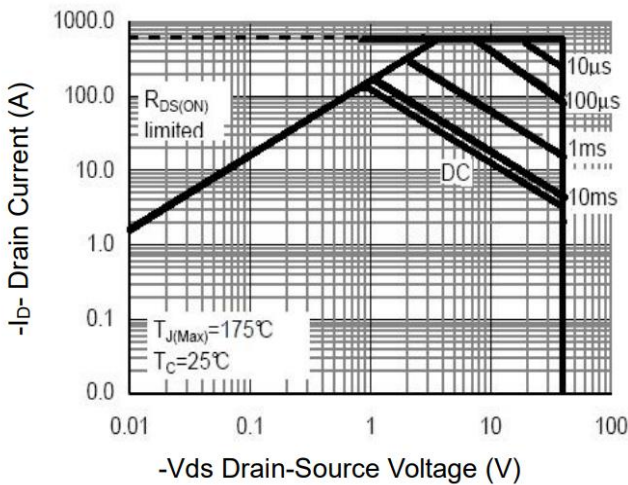


Figure 9 Safe Operation Area (Note 3)

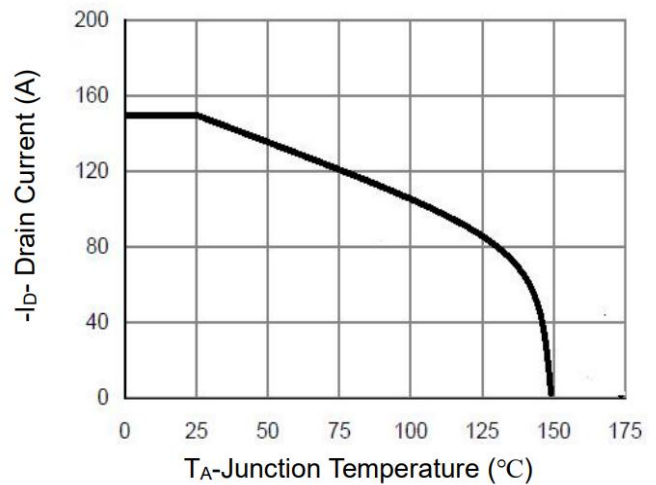


Figure 10 Current De-rating

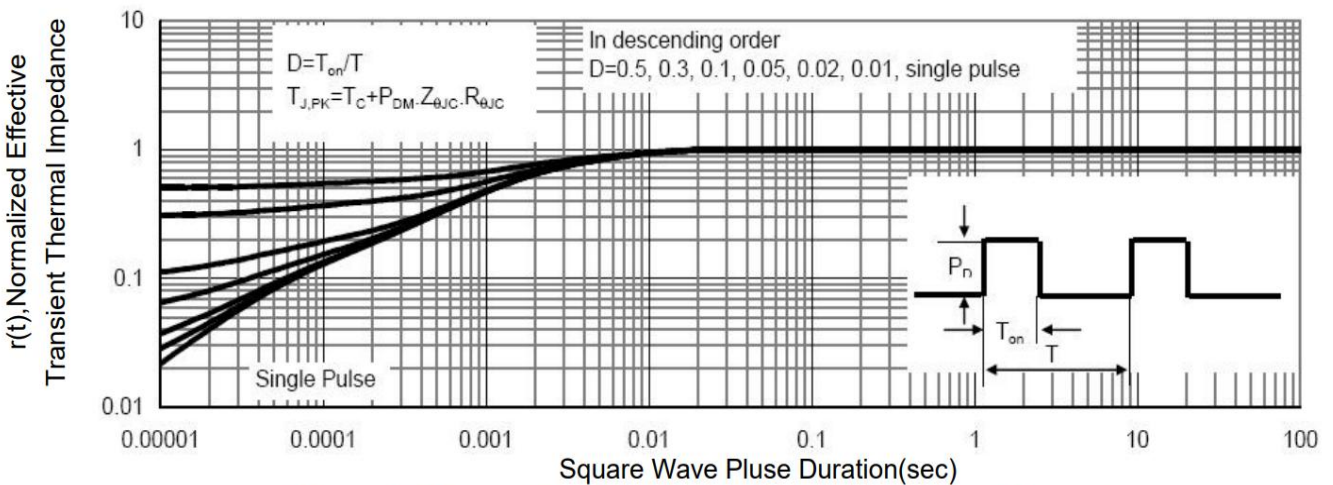
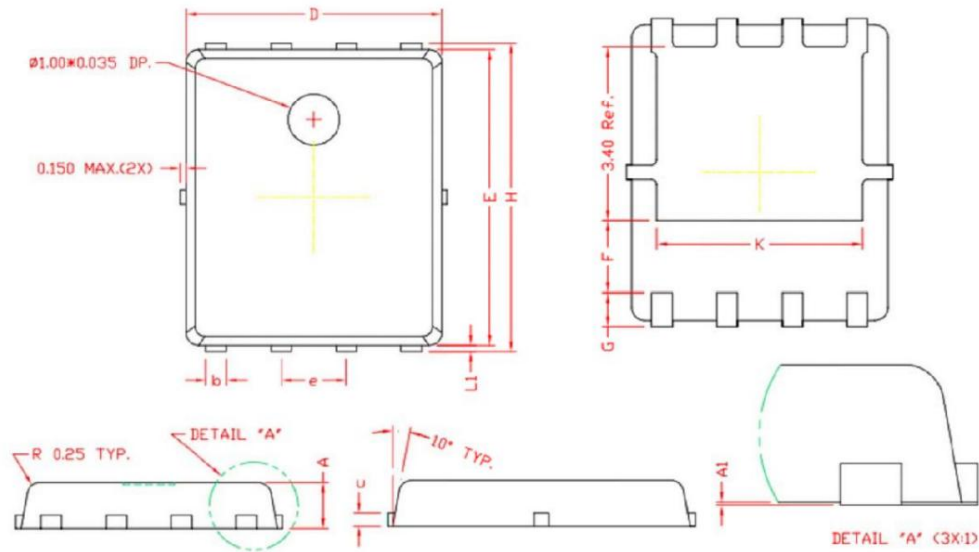


Figure 11 Normalized Maximum Transient Thermal Impedance

DFN5X6-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.800	1.000	0.031	0.039
A1	0.000	0.050	0.000	0.002
b	0.350	0.490	0.013	0.019
c	0.254REF		0.010REF	
D	4.900	5.100	0.192	0.200
E	5.700	5.900	0.224	0.232
H	5.950	6.200	0.234	0.244
F	1.400REF.		0.055TYP.	
e	1.270BSC.		0.050BSC.	
G	0.600REF		0.024REF	
K	4.000REF		0.157REF	
L1	0.100	0.180	0.003	0.007