

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
40V	1.3mΩ@10V	300A

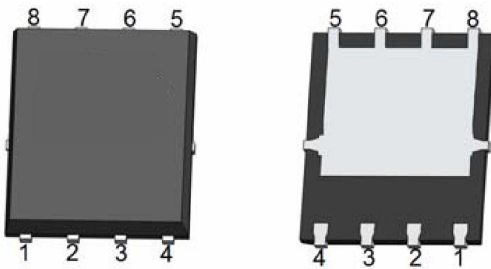
Feature

- Excellent gate charge x $R_{DS(on)}$ product(FOM)
- Very low on-resistance $R_{DS(on)}$

Application

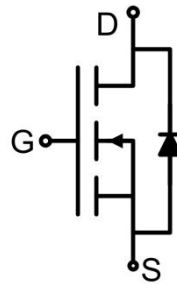
- Automotive application
- DC/DC Converter
- Ideal for high-frequency switching and synchronous rectification

Package

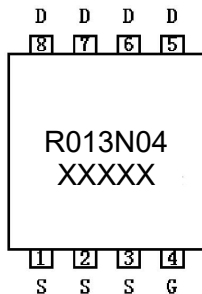


DFN5X6-8L

Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	40	V
Gate-Source Voltage	V _{GS}	±20	V
Continuous Drain Current (Silicon limited) ²⁾	I _D	300	A
Continuous Drain Current (Silicon limited) ²⁾	I _D (100°C)	213	A
Pulsed Drain Current	I _{DM}	800	A
Power Dissipation	P _D	220	W
Thermal Resistance, Junction-to-Case	R _{θJC}	0.68	°C/W
Single pulse avalanche energy ⁴⁾	E _{AS}	1800	mJ
Junction Temperature	T _J	175	°C
Storage Temperature	T _{STG}	-55 ~ +175	°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	2.0		4.0	V
Drain-source on-resistance ¹⁾	R _{DS(on)}	V _{GS} = 10V, I _D = 20A		0.95	1.3	mΩ
Dynamic characteristics²⁾						
Input Capacitance	C _{iss}	V _{DS} = 20V, V _{GS} = 0V, f = 1MHz		5835		pF
Output Capacitance	C _{oss}			2321		
Reverse Transfer Capacitance	C _{rss}			70		
Total Gate Charge	Q _g	V _{DS} = 20V, V _{GS} = 10V, I _D = 20A		91		nC
Gate-Source Charge	Q _{gs}			29.4		
Gate-Drain Charge	Q _{gd}			19		
Turn-on delay time	t _{d(on)}	V _{DD} = 20V, V _{GS} = 10V, I _D = 20A, R _{GEN} = 1.6Ω		14.5		nS
Turn-on rise time	t _r			8		
Turn-off delay time	t _{d(off)}			58		
Turn-off fall time	t _f			10		
Source-Drain Diode characteristics						
Diode Forward Current ¹⁾	I _S				300	A
Diode Forward voltage	V _{DS}	V _{GS} = 0V, I _S = 20A			1.2	V
Reverse Recovery Time	t _{rr}	T _J = 25°C, I _F = I _S di/dt = 100A/μs ¹⁾		35		nS
Reverse Recovery Charge	Q _{rr}			120		nC

Notes:

- 1) Pulse Test: Pulse Width < 300μs, Duty Cycle ≤ 2%.
- 2) Guaranteed by design, not subject to production testing.
- 3) These curves are based on the junction-to-case thermal impedance which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of T_{J(MAX)} = 175°C. The SOA curve provides a single pulse rating.
- 4) EAS condition : T_J = 25°C, V_{DD} = 20V, V_G = 10V, L = 0.5mH, R_g = 25Ω

Typical Characteristics

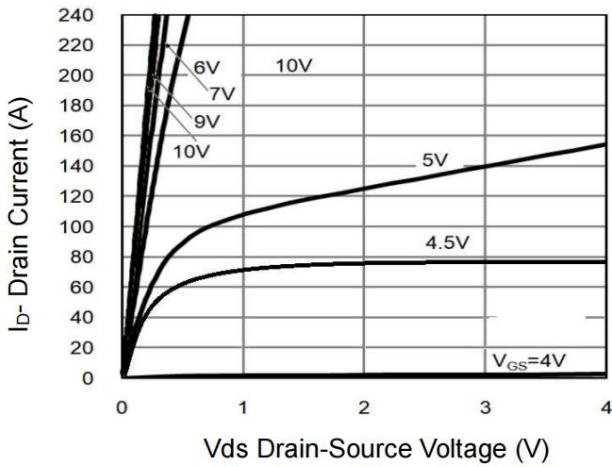


Figure 1 Output Characteristics

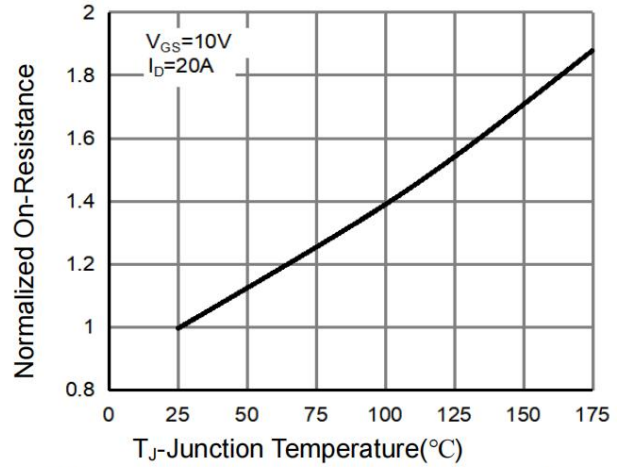


Figure 2 Rdson-Junction Temperature

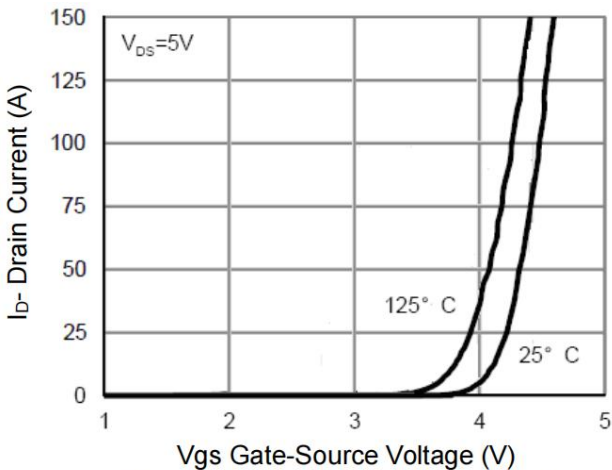


Figure 3 Transfer Characteristics

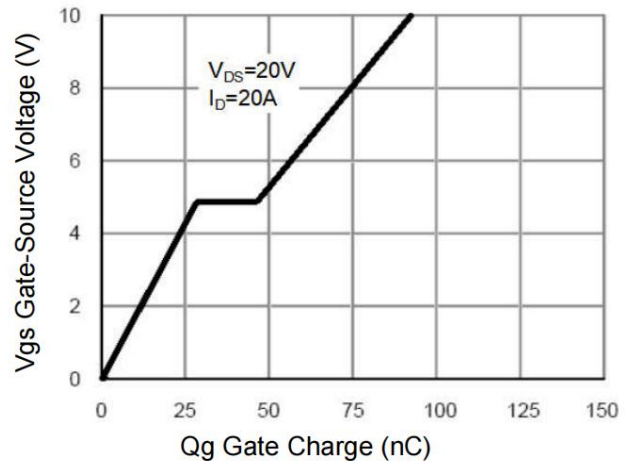


Figure 4 Gate Charge

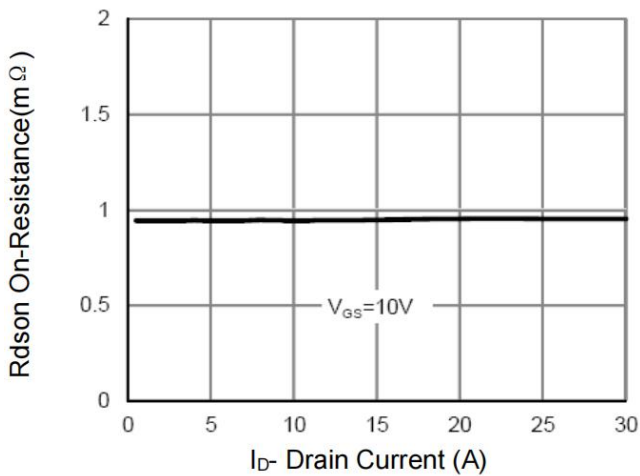


Figure 5 Rdson- Drain Current

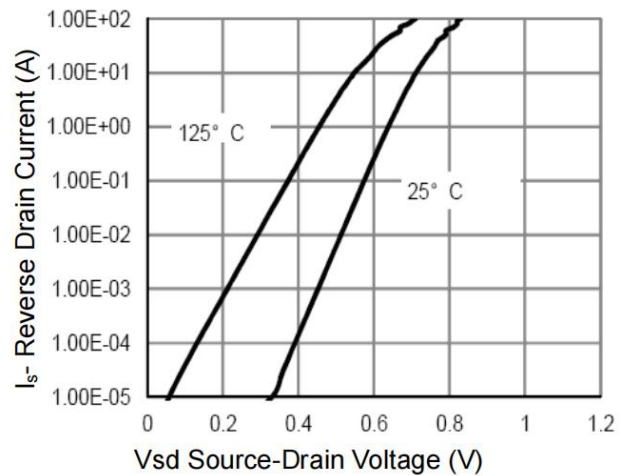


Figure 6 Source- Drain Diode Forward

Typical Characteristics

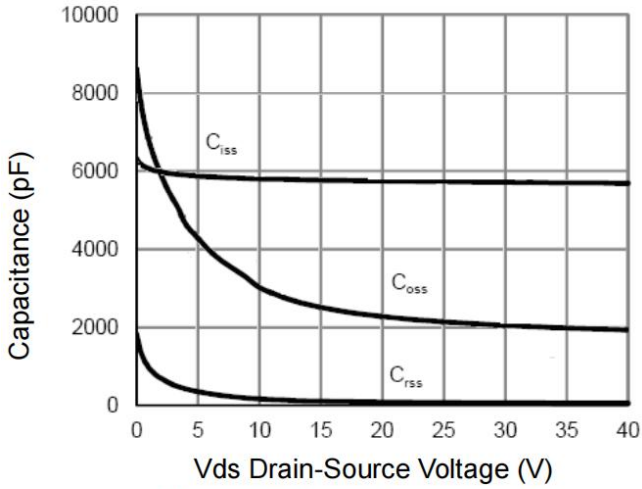


Figure 7 Capacitance vs Vds

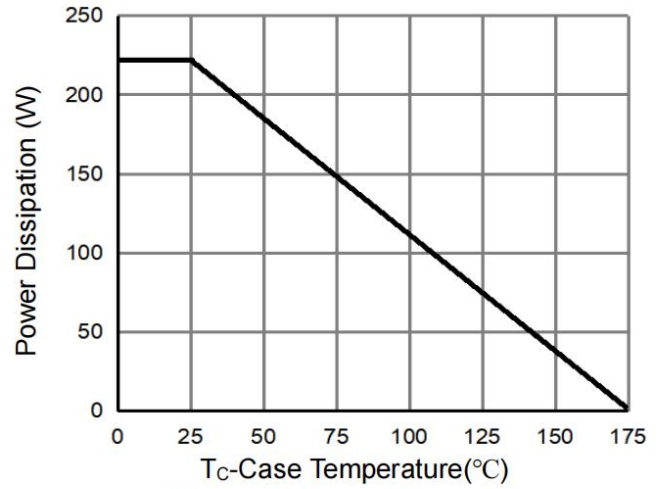


Figure 8 Power De-rating

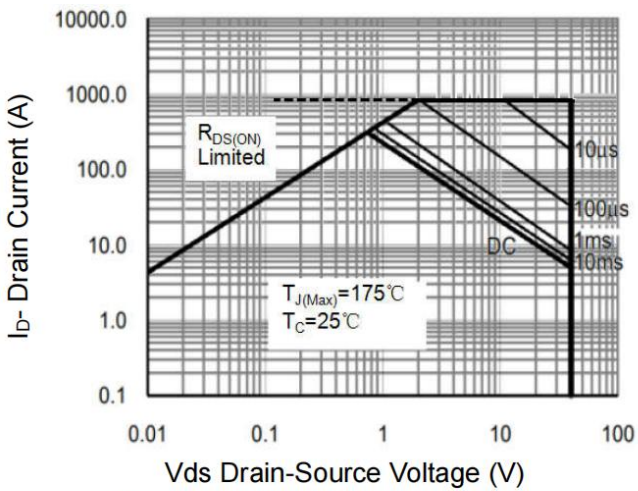


Figure 9 Safe Operation Area (Note 3)

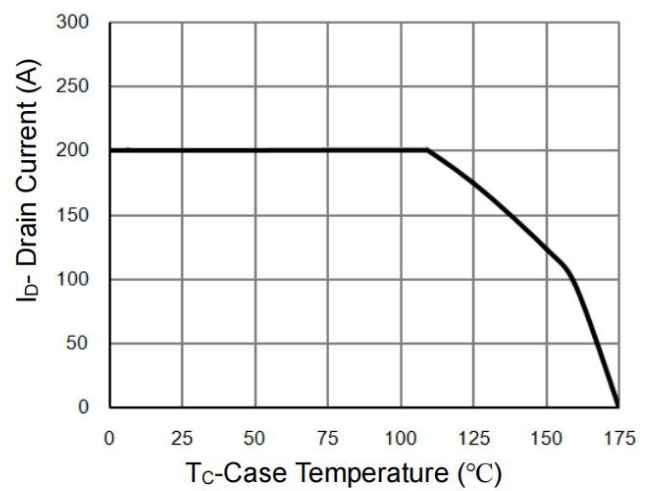


Figure 10 Current De-rating

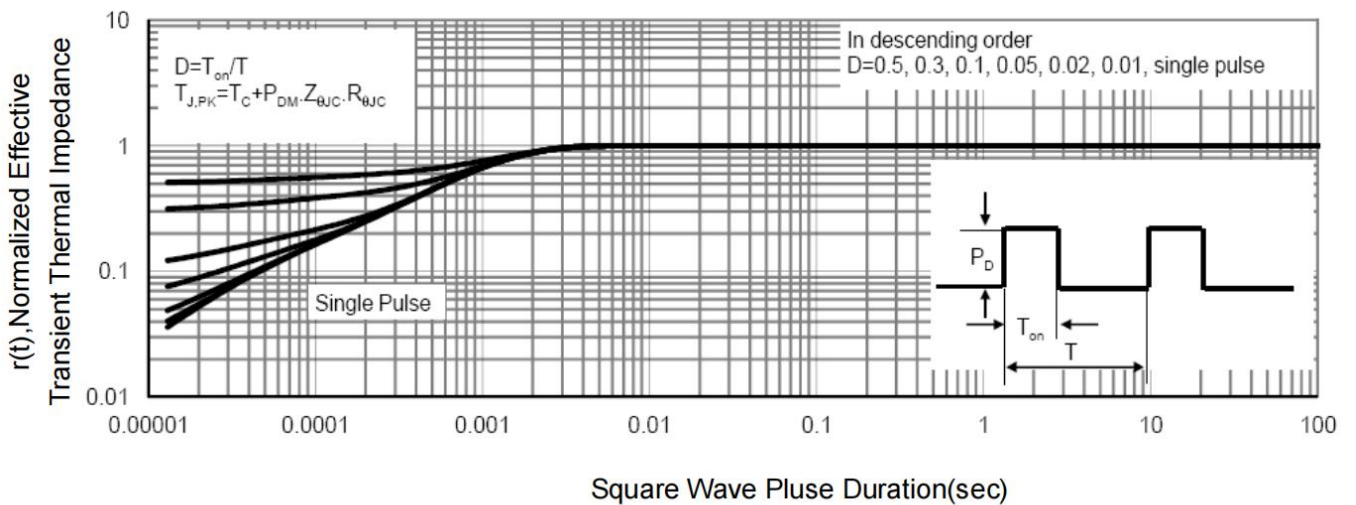
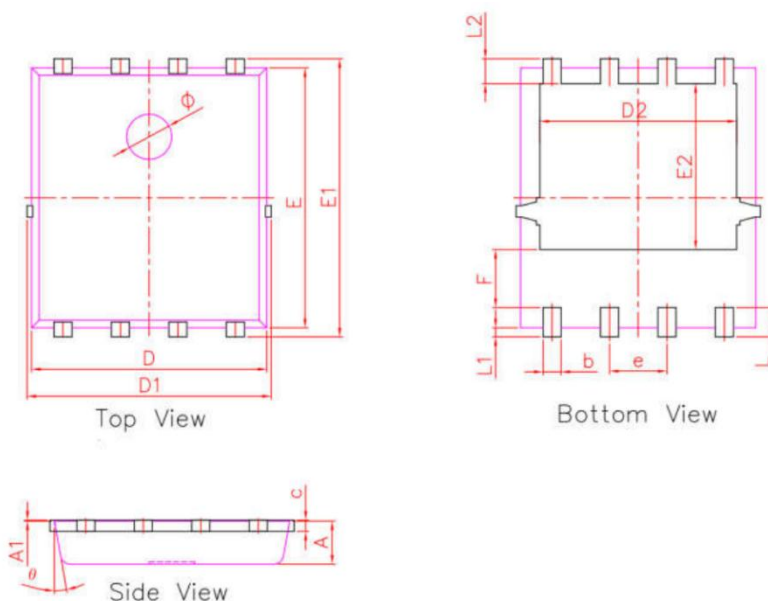


Figure 11 Normalized Maximum Transient Thermal Impedance

DFN5X6-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.200	0.035	0.047
A1	0.000	0.100	0.000	0.004
b	0.350	0.500	0.013	0.020
c	0.200	0.300	0.007	0.012
D	5.100	5.300	0.200	0.209
D1	5.100	5.500	0.200	0.217
D2	4.250	4.450	0.167	0.176
E	5.700	5.800	0.224	0.229
E1	6.000	6.300	0.236	0.248
E2	3.570	3.770	0.140	0.148
e	1.270BSC.		0.050BSC	
F	1.180	1.380	0.046	0.055
L	0.550	0.750	0.021	0.030
L1	0.150	0.250	0.005	0.010
L2	0.450	0.650	0.017	0.026
θ	8°	12°	8°	12°
Φ	0.900	1.100	0.035	0.044