

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
40V	2.8mΩ@10V	90A
	3.9mΩ@4.5V	

Feature

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

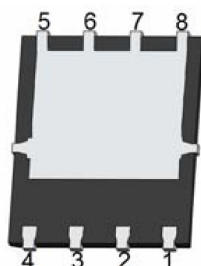
Application

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

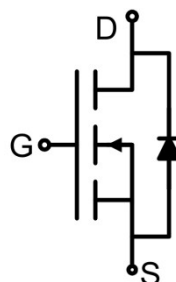
Package



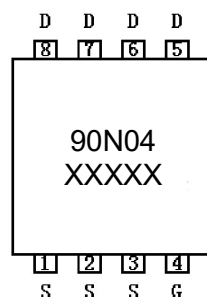
DFN5X6-8L



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	90	A
Pulsed Drain Current	I_{DM}	340	A
Power Dissipation	P_D	70	W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.8	$^{\circ}C/W$
Single pulse avalanche energy	E_{AS}	500	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	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	40			V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 40V, V_{GS} = 0V$			1	μA
Gate-body leakage current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 100	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.0	1.5	2.2	V
Drain-source on-resistance ¹⁾	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 55A$		2.4	2.8	m Ω
		$V_{GS} = 4.5V, I_D = 55A$		3.3	3.9	
Forward transconductance ¹⁾	g_{FS}	$V_{DS} = 5V, I_D = 55A$		60		S
Dynamic characteristics ²⁾						
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	$t_{d(on)}$	$V_{DD} = 20V, V_{GS} = 10V, I_D = 55A, R_{GEN} = 1.6\Omega$		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				90	A
Diode Forward voltage	V_{DS}	$V_{GS} = 0V, I_S = 55A$			1.2	V
Reverse Recovery Time	t_{rr}	$T_J = 25^{\circ}C, I_F = I_S$ $di/dt = 100A/\mu s$ ¹⁾		24		nS
Reverse Recovery Charge	Q_{rr}			68		nC

Notes:

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

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

Typical Characteristics

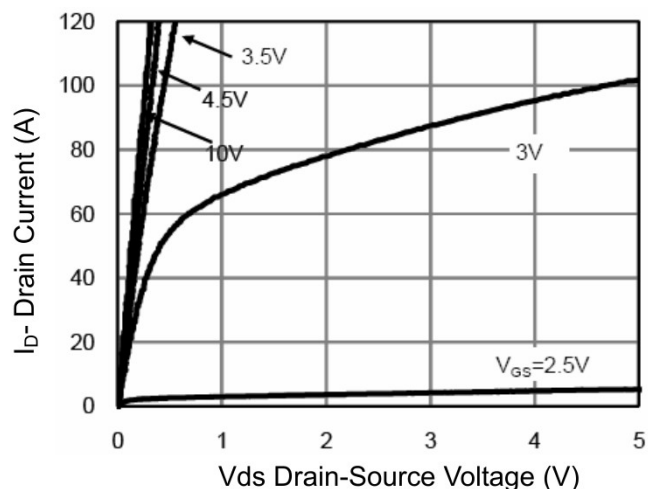


Figure 1 Output Characteristics

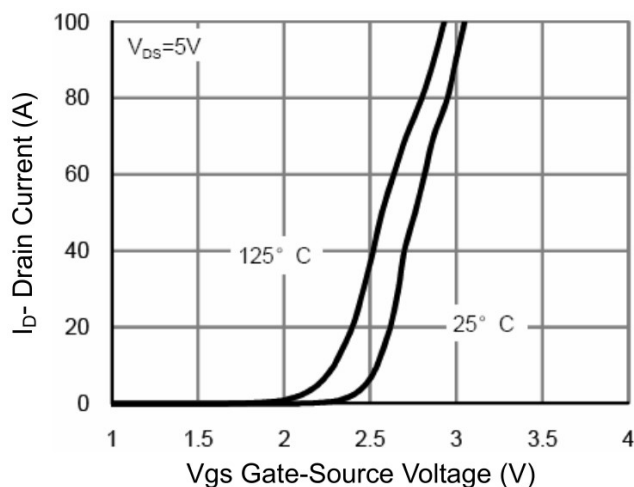


Figure 2 Transfer Characteristics

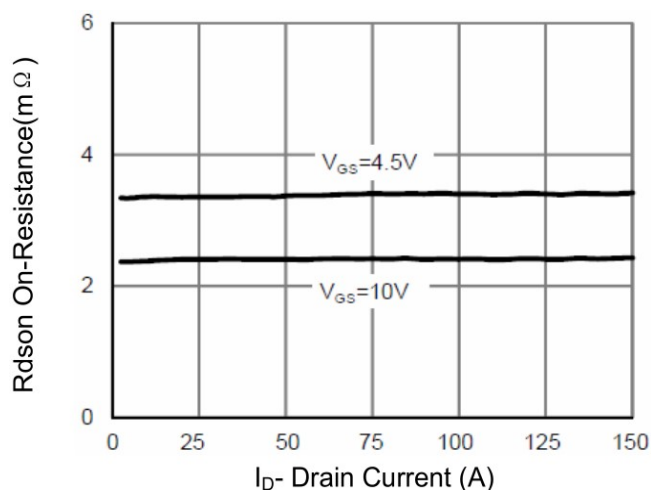


Figure 3 Rdson- Drain Current

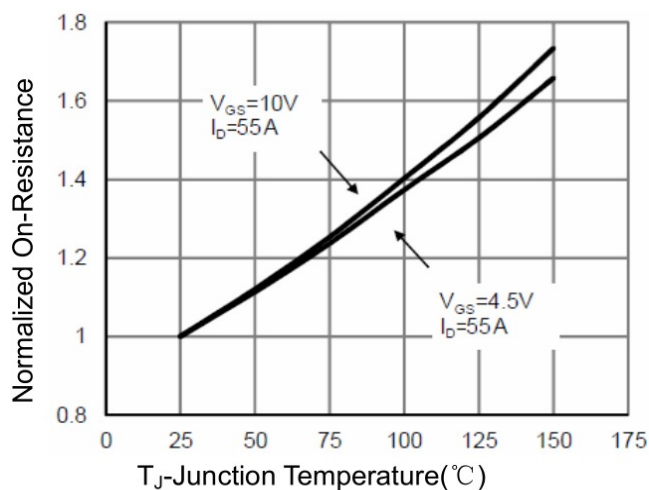


Figure 4 Rdson-Junction Temperature

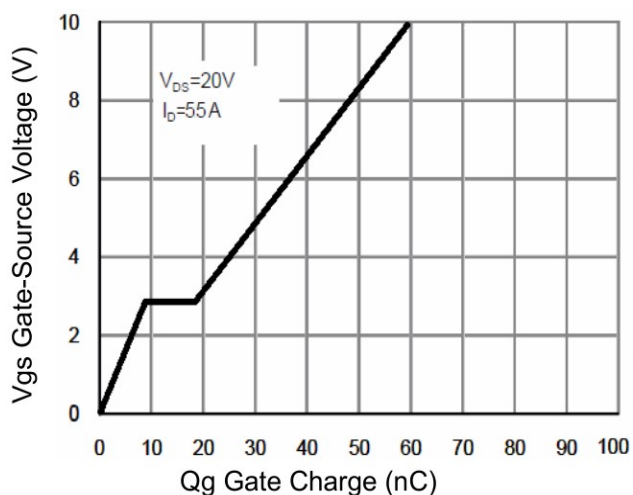


Figure 5 Gate Charge

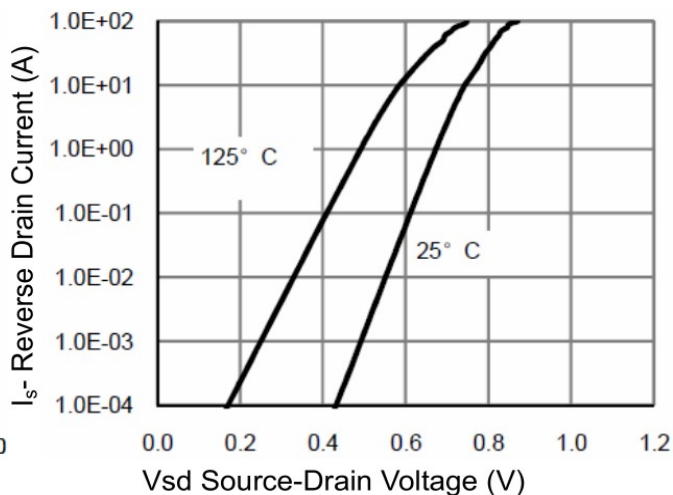


Figure 6 Source- Drain Diode Forward

Typical Characteristics

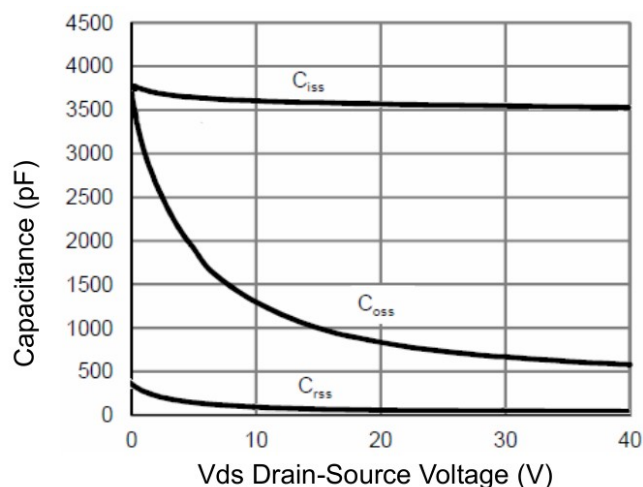


Figure 7 Capacitance vs Vds

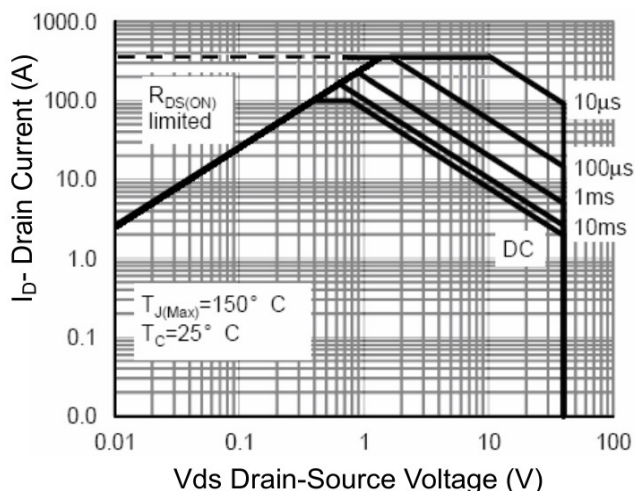


Figure 8 Safe Operation Area

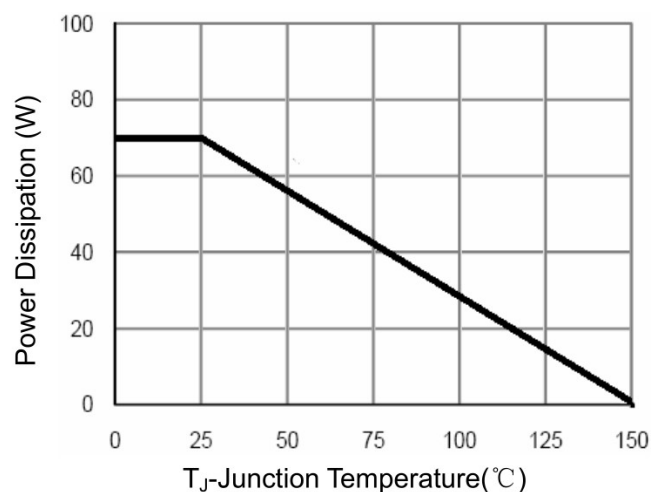


Figure 9 Power De-rating

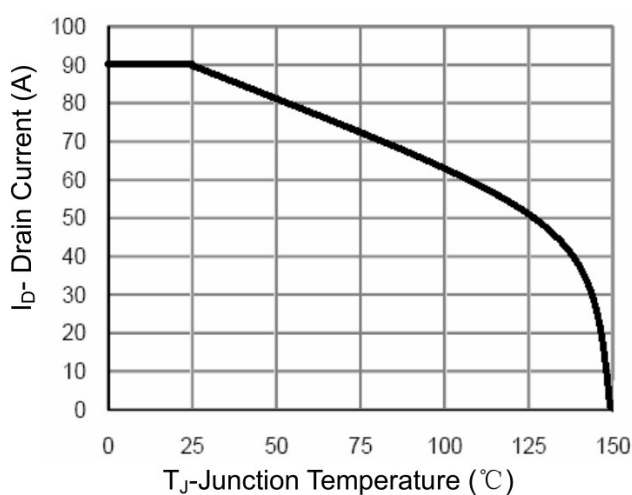


Figure 10 Current De-rating

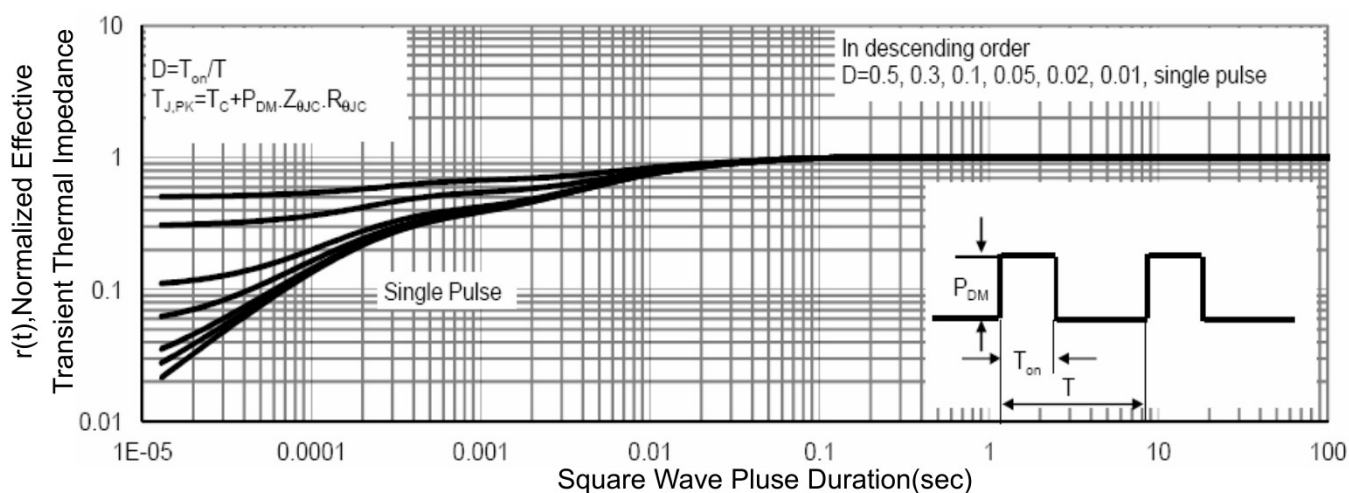
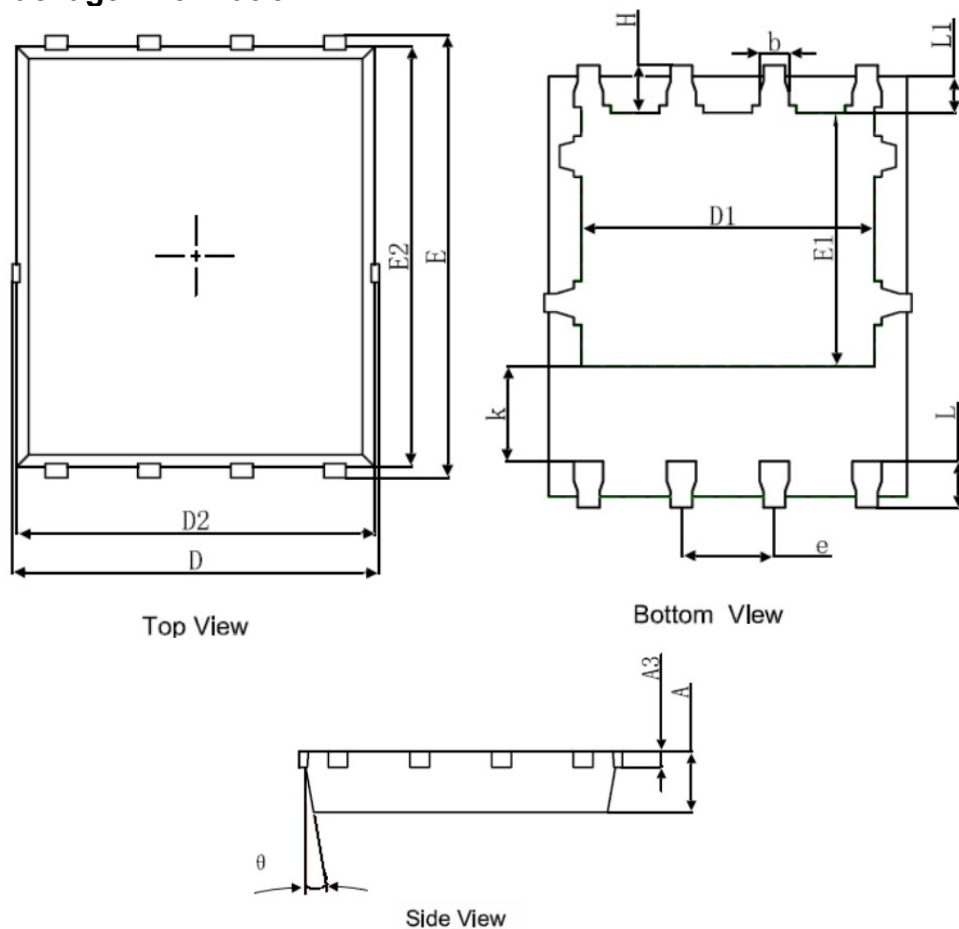


Figure 11 Normalized Maximum Transient Thermal Impedance

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°