

### Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D$
30V	10mΩ@10V	40A
	14mΩ@4.5V	

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D$
-30V	17mΩ@-10V	-40A
	27mΩ@-4.5V	

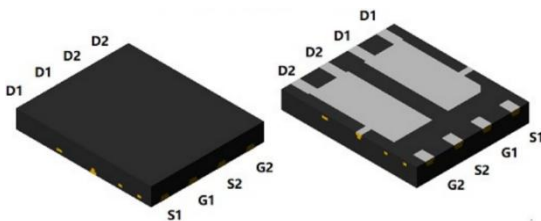
### Feature

- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Trench FET Power MOSFET technology
- Excellent package for good heat dissipation

### Application

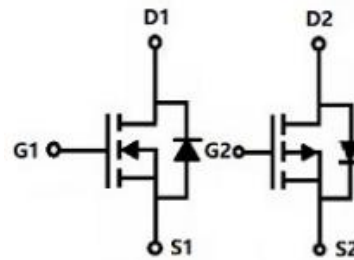
- High current load applications
- Load switching
- Hard switched and high frequency circuits
- Uninterruptible power supply

### Package

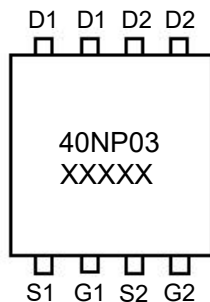


DFN5X6-8L

### Circuit diagram



### Marking



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

Parameter	Symbol	N-Channel	p-Channel	Unit
Drain-Source Voltage	V <sub>DS</sub>	30	-30	V
Gate-Source Voltage	V <sub>GS</sub>	±20	±25	V
Continuous Drain Current	I <sub>D</sub>	40	-40	A
Pulsed Drain Current <sup>1)</sup>	I <sub>DM</sub>	140	-160	A
Power Dissipation	P <sub>D</sub>	21	35	W
Single Pulse Avalanche Energy <sup>2)</sup>	E <sub>AS</sub>	56	72	mJ
Thermal Resistance, Junction-to-Case <sup>3)</sup>	R <sub>θjc</sub>	6.0	3.57	°C/W
Junction Temperature	T <sub>J</sub>	-55 ~ +150		°C
Storage Temperature	T <sub>STG</sub>	-55 ~ +150		°C

### N-CH Electrical characteristics (T<sub>J</sub>=25 °C, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA	30			V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> = 30V, V <sub>GS</sub> = 0V			1	μA
Gate-body leakage current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V			±100	nA
Gate threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	1.0	1.5	2.5	V
Drain-source on-resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 15A		8	10	mΩ
		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 10A		12	14	mΩ
<b>Dynamic characteristics</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 15V, V <sub>GS</sub> = 0V, f = 1MHz		1015		pF
Output Capacitance	C <sub>oss</sub>			201		
Reverse Transfer Capacitance	C <sub>rss</sub>			164		
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = 15V, V <sub>GS</sub> = 10V, I <sub>D</sub> = 15A		23.6		nC
Gate-Source Charge	Q <sub>gs</sub>			3.9		
Gate-Drain Charge	Q <sub>gd</sub>			7		
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> = 20V, V <sub>GS</sub> = 10V, I <sub>D</sub> = 2A R <sub>L</sub> = 1Ω, R <sub>GEN</sub> = 3Ω		7		nS
Turn-on rise time	t <sub>r</sub>			19		
Turn-off delay time	t <sub>d(off)</sub>			24		
Turn-off fall time	t <sub>f</sub>			24		
<b>Source-Drain Diode characteristics</b>						
Diode Forward Current	I <sub>S</sub>				40	A
Diode Forward voltage	V <sub>DS</sub>	V <sub>GS</sub> = 0V, I <sub>S</sub> = 15A			1.2	V
Reverse Recovery Time	t <sub>rr</sub>	T <sub>J</sub> = 25°C, I <sub>F</sub> = 25A		5		nS
Reverse Recovery Charge	Q <sub>rr</sub>	di/dt = 100A/μs		0.2		nC

### P-CH Electrical characteristics (T<sub>J</sub>=25 °C, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA	-30			V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> = -30V, V <sub>GS</sub> = 0V			-1	μA
Gate-body leakage current	I <sub>GSS</sub>	V <sub>GS</sub> = ±25V, V <sub>DS</sub> = 0V			±100	nA
Gate threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA	-1.2	-1.8	-2.8	V
Drain-source on-resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> = -10V, I <sub>D</sub> = -15A		13	17	mΩ
		V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -10A		17	27	mΩ
<b>Dynamic characteristics</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = -15V, V <sub>GS</sub> = 0V, f = 1MHz		2152		pF
Output Capacitance	C <sub>oss</sub>			308		
Reverse Transfer Capacitance	C <sub>rss</sub>			242		
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = -15V, V <sub>GS</sub> = -10V, I <sub>D</sub> = -12A		40.1		nC
Gate-Source Charge	Q <sub>gs</sub>			8.4		
Gate-Drain Charge	Q <sub>gd</sub>			8.6		
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> = -15V, V <sub>GS</sub> = -10V, I <sub>D</sub> = -1A, R <sub>GEN</sub> = 2.5Ω		8		nS
Turn-on rise time	t <sub>r</sub>			19		
Turn-off delay time	t <sub>d(off)</sub>			75		
Turn-off fall time	t <sub>f</sub>			46		
<b>Source-Drain Diode characteristics</b>						
Diode Forward Current	I <sub>S</sub>				-40	A
Diode Forward voltage	V <sub>DS</sub>	V <sub>GS</sub> = 0V, I <sub>S</sub> = -15A			-1.2	V
Reverse Recovery Time	t <sub>rr</sub>	T <sub>J</sub> = 25°C, I <sub>F</sub> = -12A di/dt = 100A/μs		18		nS
Reverse Recovery Charge	Q <sub>rr</sub>			7.8		nC

Notes:

- 1) Pulse Test: Pulse Width < 300μs, Duty Cycle ≤2%.
- 2) T<sub>J</sub>=25°C, V<sub>DD</sub>=20V, V<sub>G</sub>=10V, L=0.5Mh.
- 3) R<sub>θJA</sub> is the sum of the junction-to-case and case-to-ambient thermal resistance, where the case thermal reference is defined as the solder mounting surface of the drain pins. R<sub>θJC</sub> is guaranteed by design, while R<sub>θJA</sub> is determined by the board design. The maximum rating presented here is based on mounting on a 1 in 2 pad of 2oz copper.

## N- Channel Typical Characteristics

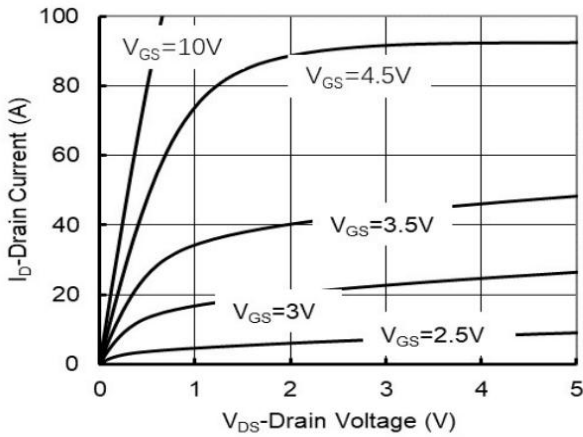


Figure1. Output Characteristics

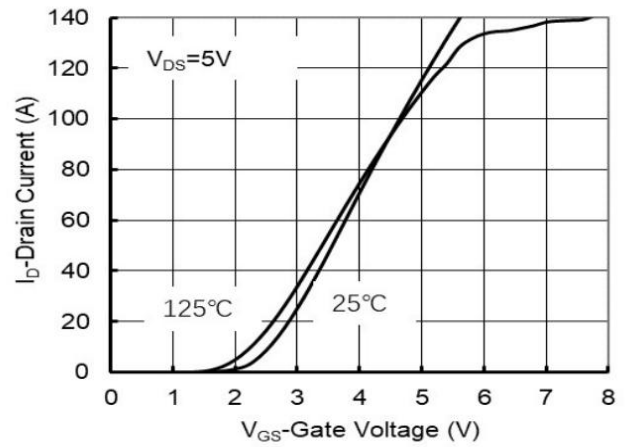


Figure2. Transfer Characteristics

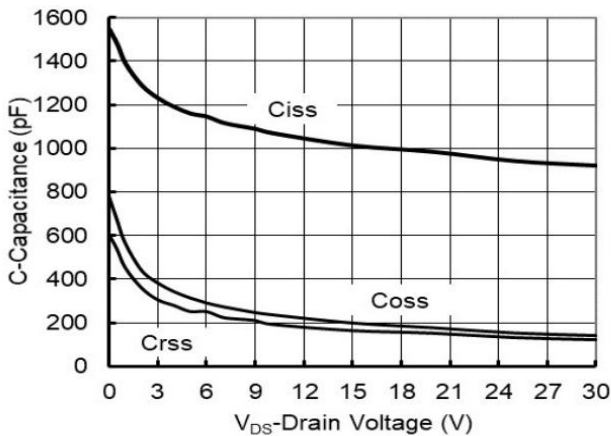


Figure3. Capacitance Characteristics

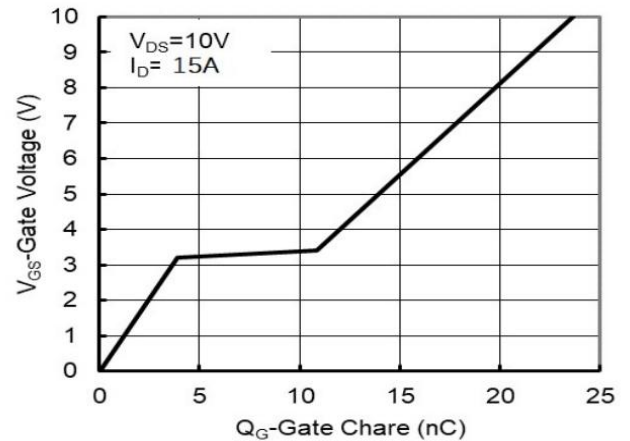


Figure4. Gate Charge

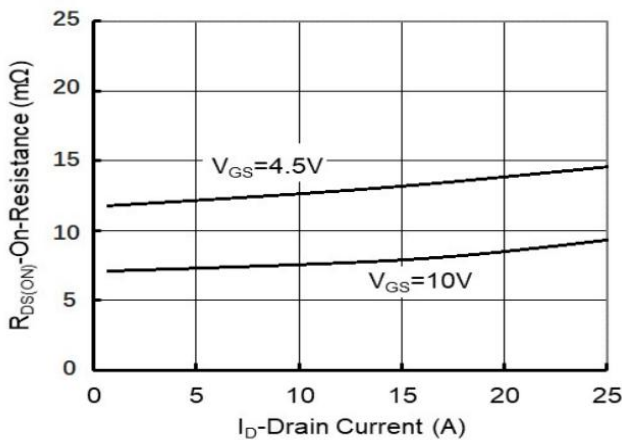


Figure5. Drain-Source on Resistance

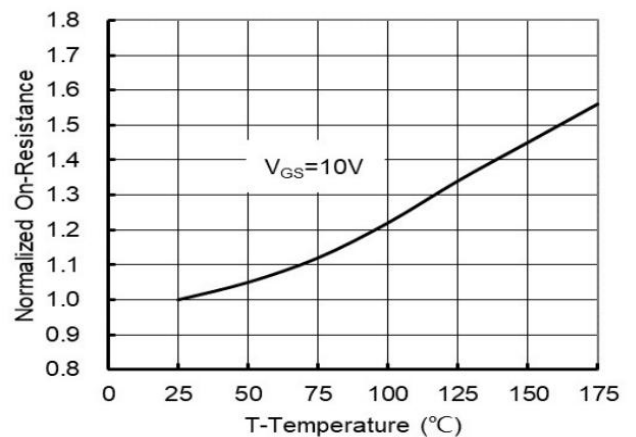


Figure6. Drain-Source on Resistance

## N- Channel Typical Characteristics

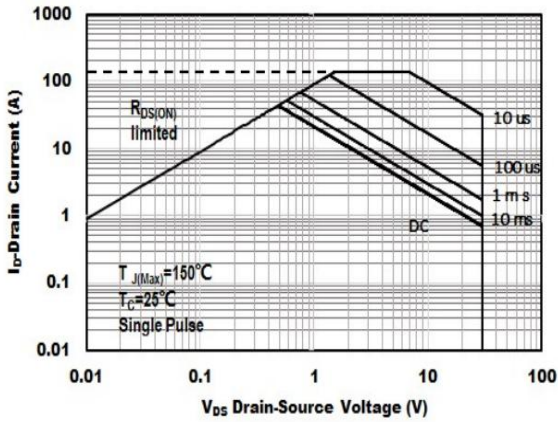


Figure7. Safe Operation Area

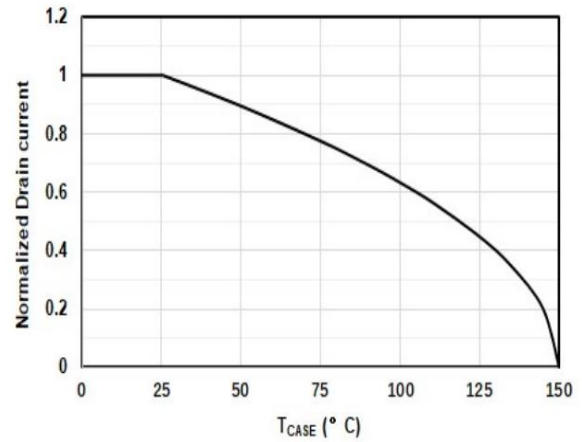


Figure8. Drain current vs. Case Temperature

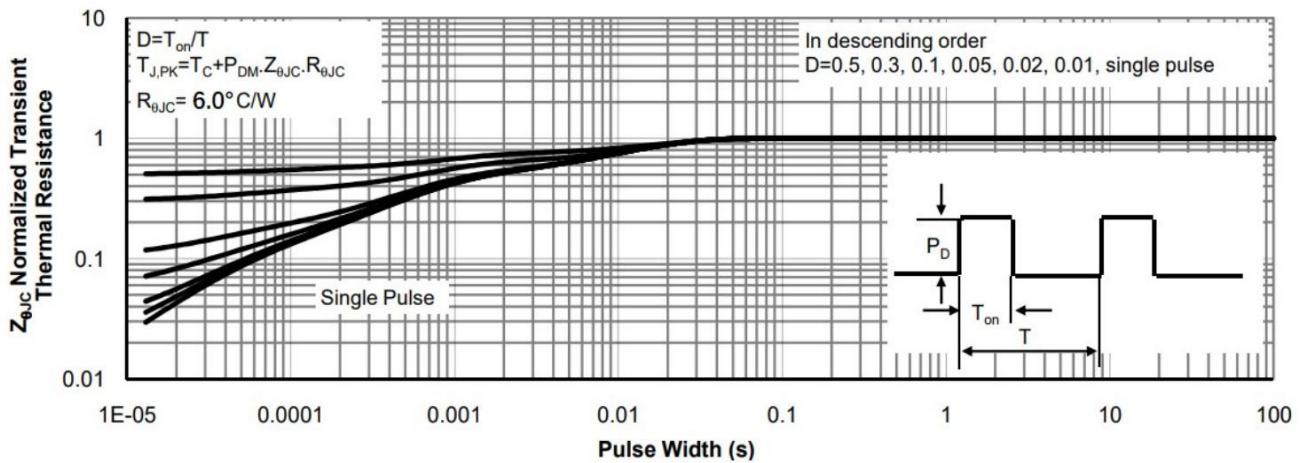


Figure 9. Normalized Maximum Transient Thermal Impedance

## P- Channel Typical Characteristics

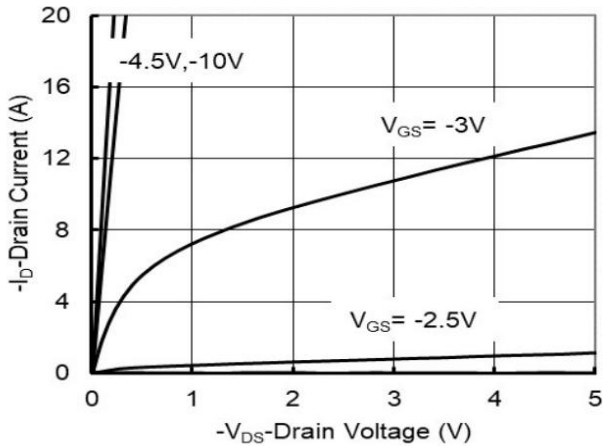


Figure1. Output Characteristics

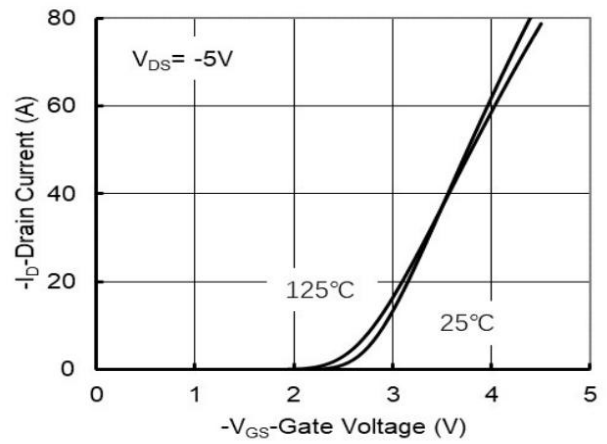


Figure2. Transfer Characteristics

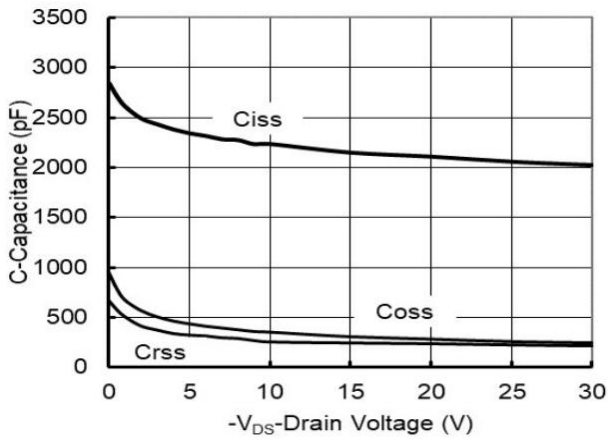


Figure3. Capacitance Characteristics

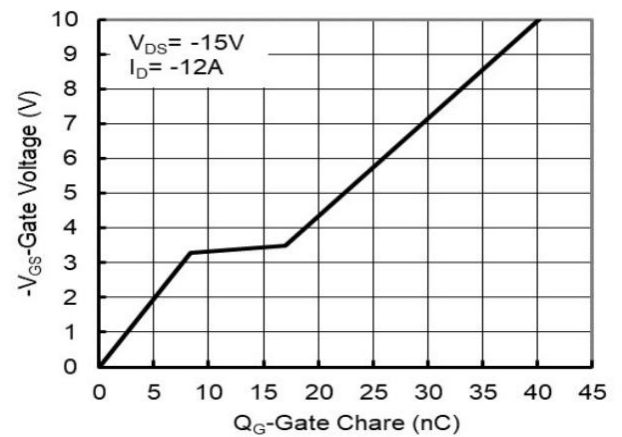


Figure4. Gate Charge

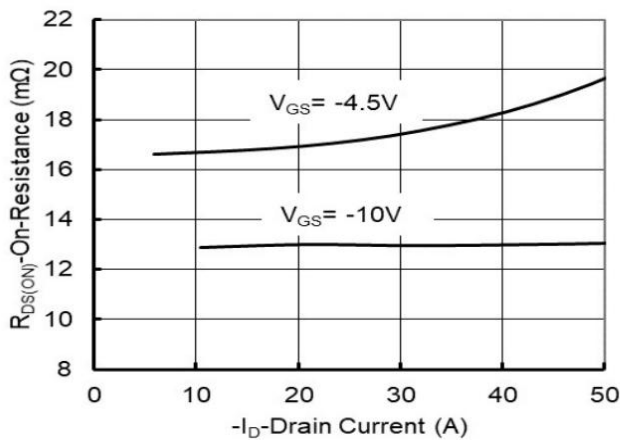


Figure5. Drain-Source on Resistance

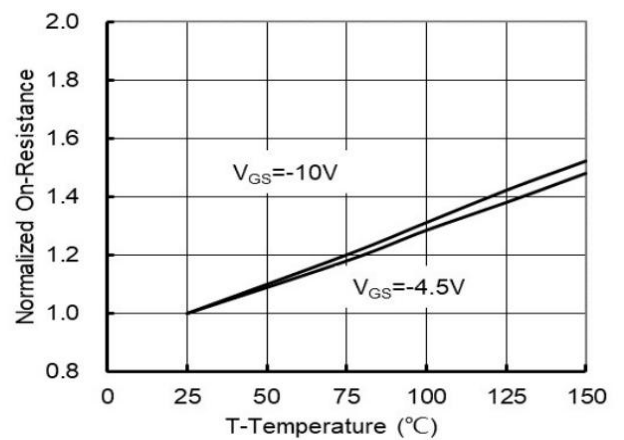


Figure6. Drain-Source on Resistance



## P- Channel Typical Characteristics

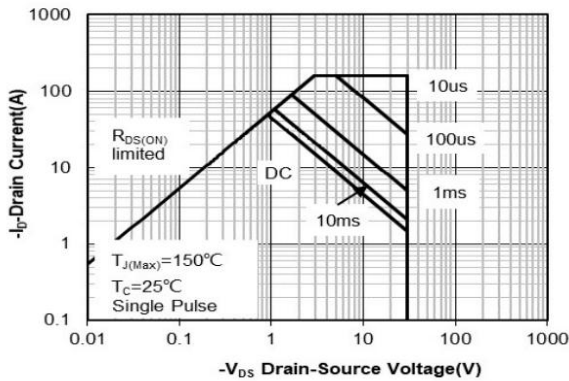


Figure7. Safe Operation Area

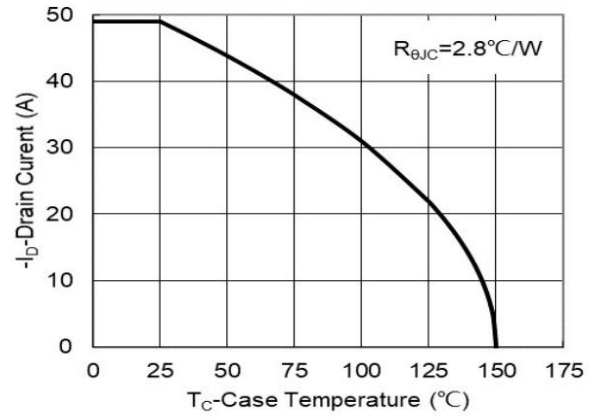


Figure8. Drain current vs. Case Temperature

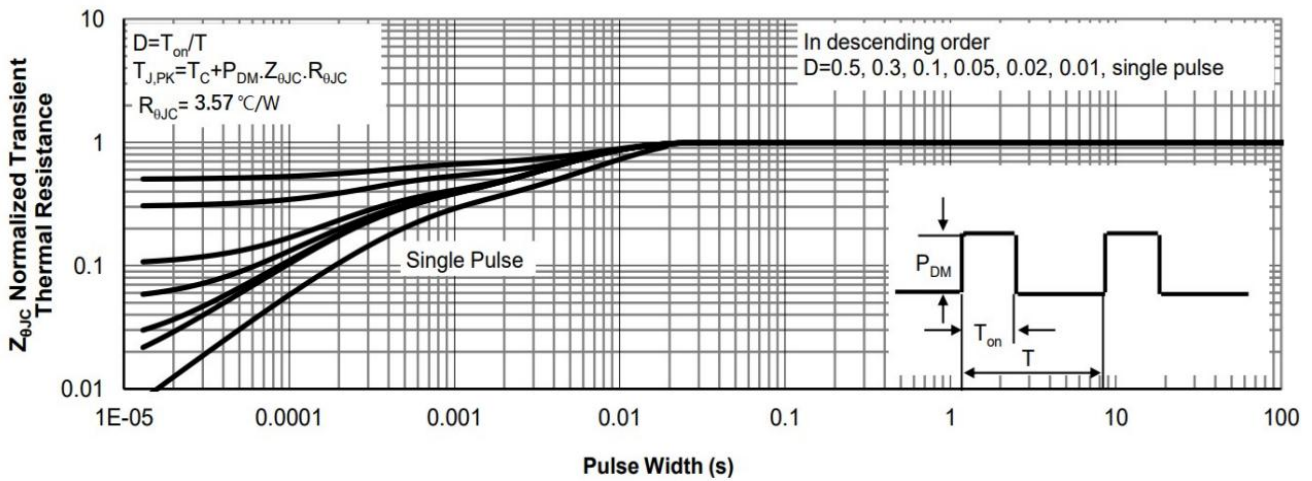
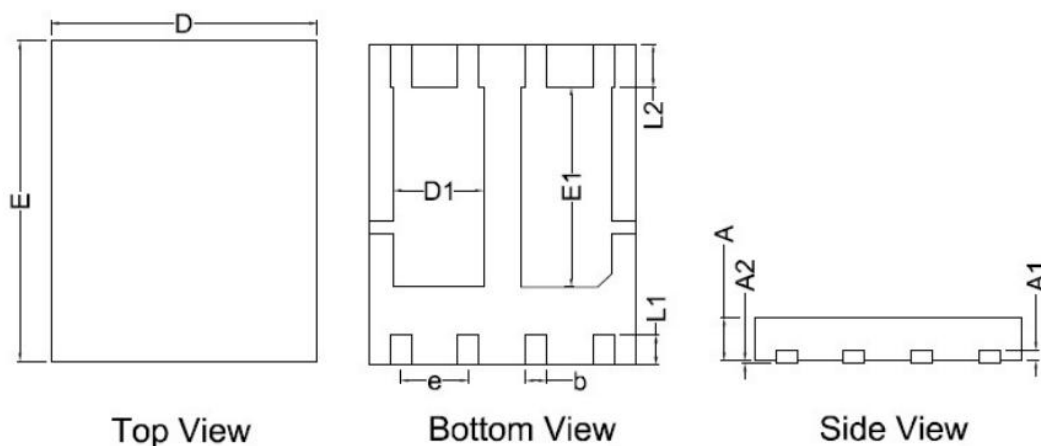


Figure 9. Normalized Maximum Transient Thermal Impedance

### DFN5X6-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.900	0.027	0.035
A1	0.200 BSC		0.008BSC	
A2	0.000	0.100	0.000	0.004
b	0.300	0.500	0.011	0.020
D	4.900	5.100	0.193	0.201
D1	1.600	1.800	0.063	0.071
E	5.900	6.100	0.232	0.240
E1	3.650	3.850	0.143	0.152
e	1.270 BSC		0.050 BSC	
L1	0.450	0.650	0.018	0.026
L2	0.800 BSC		0.031 BSC	