

### Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D$
40V	3.5mΩ@10V	100A
	4.8mΩ@4.5V	

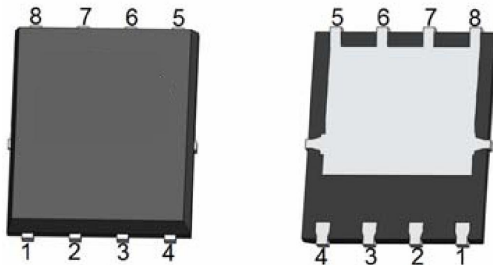
### Feature

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

### Application

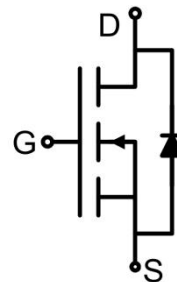
- DC/DC converter
- Power management functions
- Backlighting

### Package

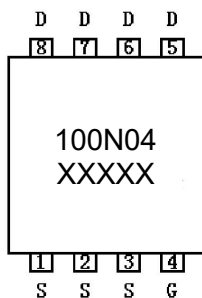


DFN5X6-8L

### 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	$I_D$	100	A
Continuous Drain Current( $T_c = 100^\circ\text{C}$ )	$I_D(100^\circ\text{C})$	63	A
Pulsed Drain Current	$I_{DM}$	360	A
Power Dissipation	$P_D$	6.2	W
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	1.67	$^\circ\text{C}/\text{W}$
Thermal Resistance,Junction-to-Ambient	$R_{\theta JA}$	20	$^\circ\text{C}/\text{W}$
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-55 ~ +150	$^\circ\text{C}$

### Electrical characteristics ( $T_A=25^\circ\text{C}$ , unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu\text{A}$	40			V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS} = 40V, V_{GS} = 0V$			1	$\mu\text{A}$
Gate-body leakage current	$I_{GSS}$	$V_{GS} = \pm 20V, V_{DS} = 0V$			±100	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	1.0		2.5	V
Drain-source on-resistance <sup>1)</sup>	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 20A$		2.8	3.5	m $\Omega$
		$V_{GS} = 4.5V, I_D = 20A$		4.0	4.8	
<b>Dynamic characteristics<sup>2)</sup></b>						
Input Capacitance	$C_{iss}$	$V_{DS} = 20V, V_{GS} = 0V, f = 1\text{MHz}$		4645		pF
Output Capacitance	$C_{oss}$			436		
Reverse Transfer Capacitance	$C_{rss}$			360		
Total Gate Charge	$Q_g$	$V_{DS} = 20V, V_{GS} = 10V, I_D = 20A$		102		nC
Gate-Source Charge	$Q_{gs}$			15.8		
Gate-Drain Charge	$Q_{gd}$			21.9		
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 20V, V_{GS} = 10V, I_D = 20A, R_{GEN} = 3\Omega$		12		nS
Turn-on rise time	$t_r$			54		
Turn-off delay time	$t_{d(off)}$			120		
Turn-off fall time	$t_f$			80		
<b>Source-Drain Diode characteristics</b>						
Diode Forward Current <sup>1)</sup>	$I_S$				100	A
Diode Forward voltage	$V_{DS}$	$V_{GS} = 0V, I_S = 20A$			1.2	V
Reverse Recovery Time	$t_{rr}$	$T_J = 25^\circ\text{C}, I_F = 20A$		22.3		nS
Reverse Recovery Charge	$Q_{rr}$	$di/dt = 100A/\mu\text{s}^1$		7.4		nC

Notes:

1) Pulse Test: Pulse Width < 300 $\mu\text{s}$ , Duty Cycle  $\leq 2\%$ .

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

## Typical Characteristics

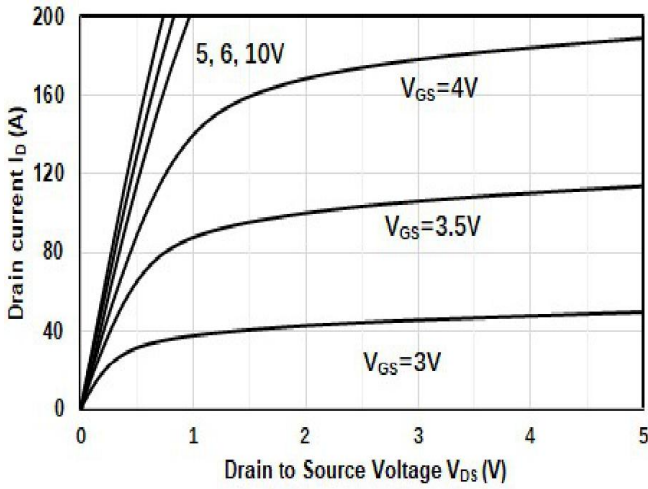


Figure1. Output Characteristics

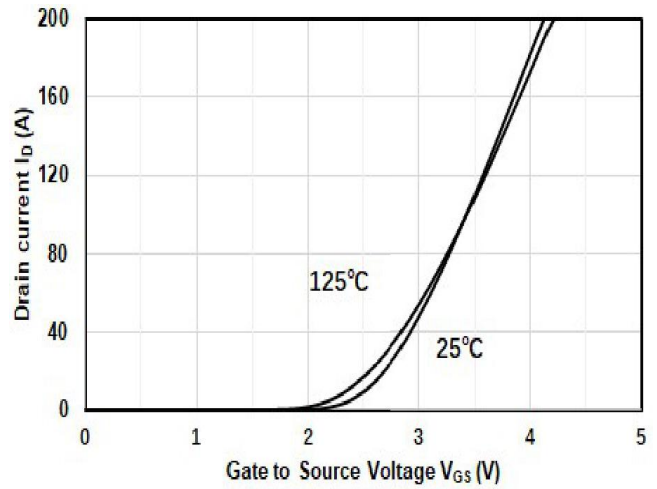


Figure2. Transfer Characteristics

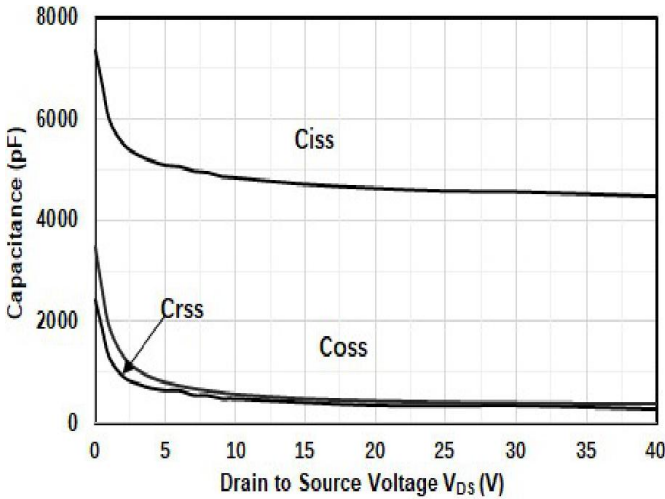


Figure3. Capacitance Characteristics

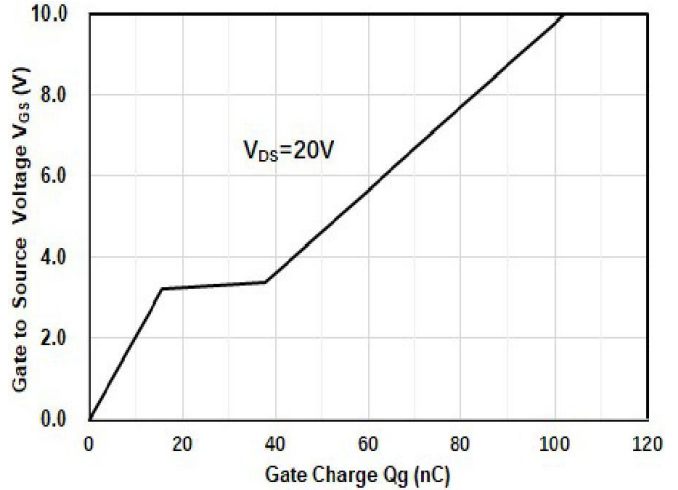


Figure4. Gate Charge

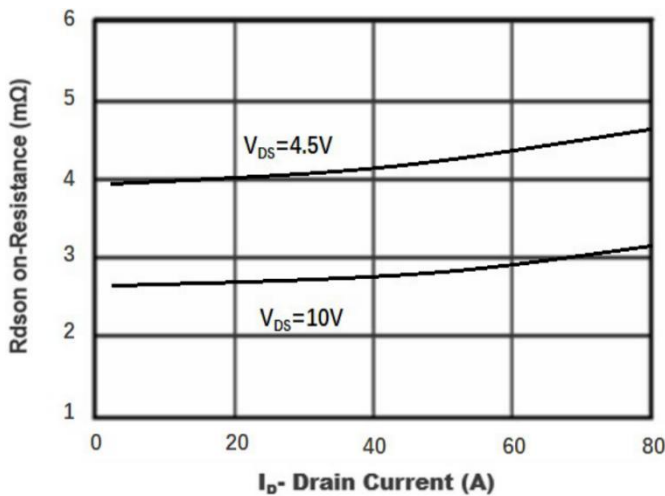


Figure5. Drain-Source on Resistance

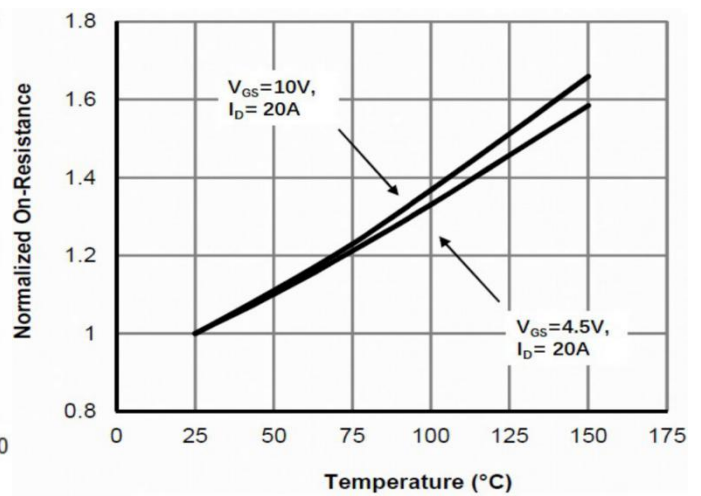


Figure6. Drain-Source on Resistance

## Typical Characteristics

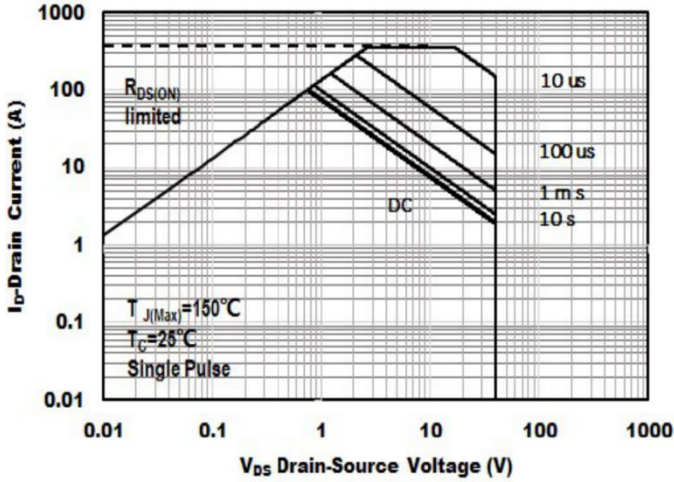


Figure7. Safe Operation Area

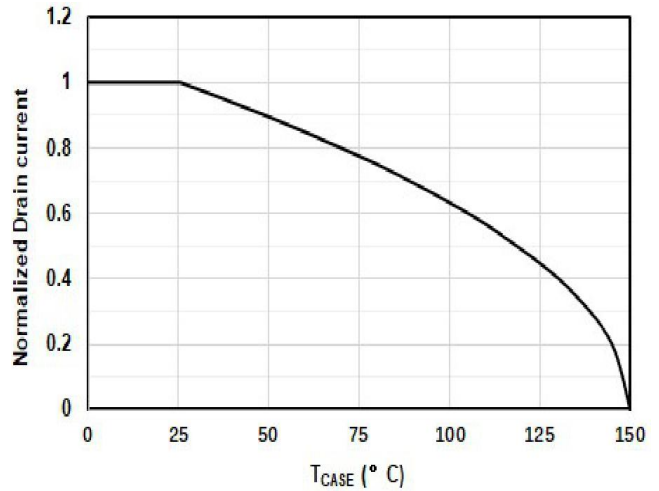


Figure8. Drain current vs. Case Temperature

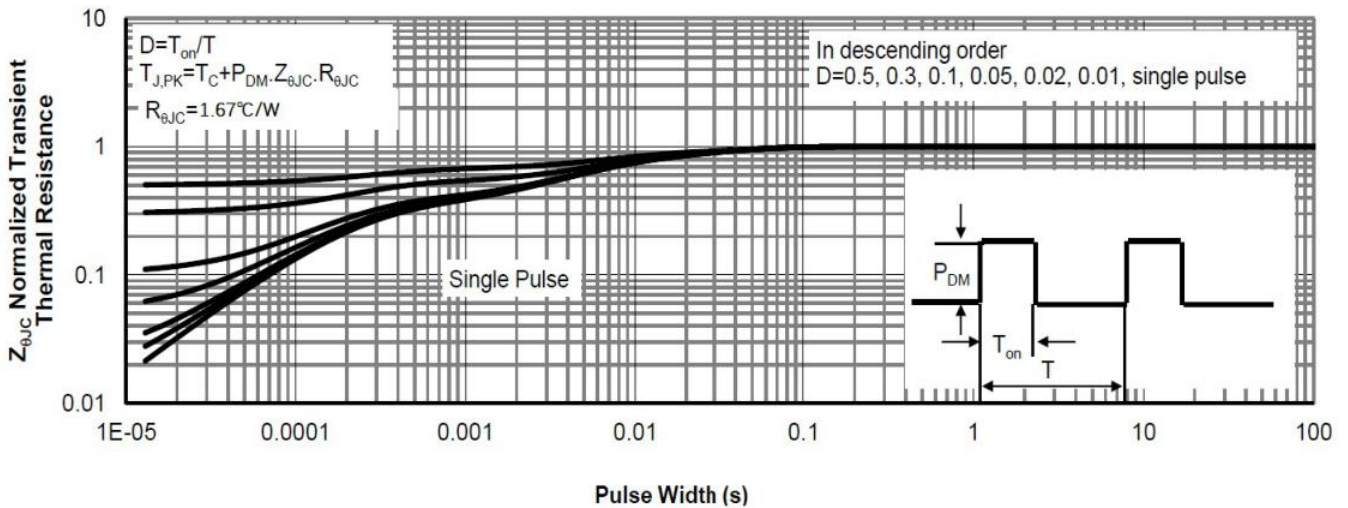
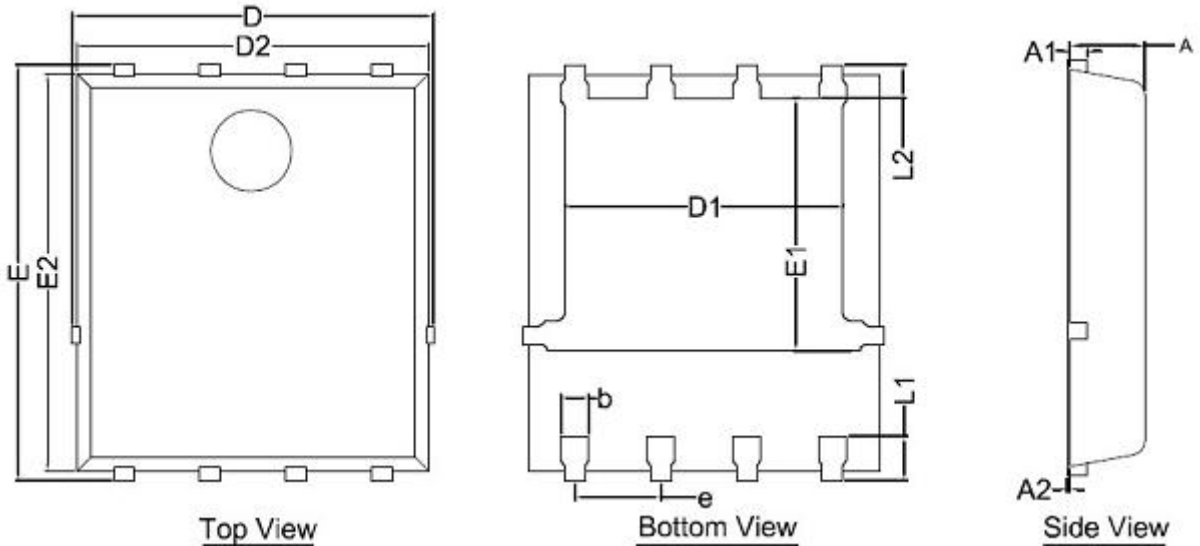


Figure9. Normalized Maximum Transient Thermal Impedance

### DFN5X6-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.000	1.200	0.039	0.047
A1	0.254BSC.		0.010BSC.	
A2	0.000	0.100		0.004
D	5.150	5.550	0.202	0.219
E	5.950	6.350	0.234	0.250
D1	3.920	4.320	0.154	0.170
E1	3.520	3.920	0.139	0.154
D2	5.000	5.400	0.197	0.212
E2	5.660	6.060	0.223	0.239
b	0.310	0.510	0.012	0.020
e	1.270BSC.		0.050BSC	
L1	0.560	0.760	0.022	0.030
L2	0.500BSC.		0.020BSC	