

### Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_b$
60V	43mΩ@10V	20A
	47mΩ@4.5V	

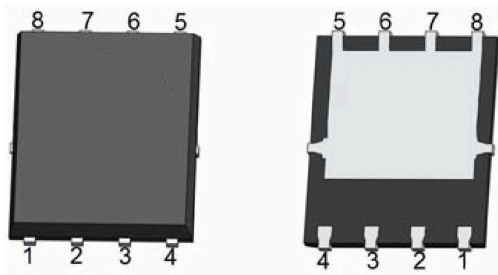
### Feature

- Excellent gate charge x  $R_{DS(on)}$  product(FOM)
- Very low on-resistance  $R_{DS(on)}$
- Suffix "-Q1" for AEC-Q101

### Application

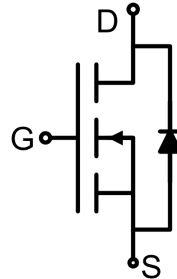
- DC/DC Converter
- Power management functions
- Industrial and Motor Drive application

### Package

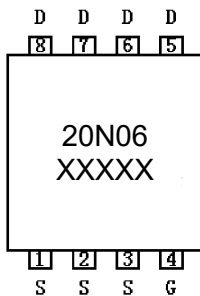


DFN5X6-8L

### Circuit diagram



### Marking



### Absolute maximum ratings ( $T_A=25^\circ\text{C}$ , unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	60	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current	$I_D$	20	A
Pulsed Drain Current	$I_{DM}$	60	A
Power Dissipation	$P_D$	14	W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	8.9	$^\circ\text{C/W}$
Single pulse avalanche energy	$E_{AS}$	20	mJ
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	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu\text{A}$	60			V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS} = 60V, V_{GS} = 0V$			1	$\mu\text{A}$
Gate-body leakage current	$I_{GSS}$	$V_{GS} = \pm 20V, V_{DS} = 0V$			$\pm 100$	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>	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 20A$			43	m $\Omega$
		$V_{GS} = 4.5V, I_D = 10A$			47	
<b>Dynamic characteristics<sup>2)</sup></b>						
Input Capacitance	$C_{iss}$	$V_{DS} = 30V, V_{GS} = 0V, f = 1\text{MHz}$		800		pF
Output Capacitance	$C_{oss}$			68		
Reverse Transfer Capacitance	$C_{rss}$			36		
Total Gate Charge	$Q_g$	$V_{DS} = 30V, V_{GS} = 10V, I_D = 10A$		15		nC
Gate-Source Charge	$Q_{gs}$			2.4		
Gate-Drain Charge	$Q_{gd}$			2.5		
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 30V, V_{GS} = 10V, I_D = 2A$ $R_L = 1\Omega, R_{GEN} = 3\Omega$		5		nS
Turn-on rise time	$t_r$			39		
Turn-off delay time	$t_{d(off)}$			19		
Turn-off fall time	$t_f$			7		
<b>Source-Drain Diode characteristics</b>						
Diode Forward Current <sup>1)</sup>	$I_S$				20	A
Diode Forward voltage	$V_{DS}$	$V_{GS} = 0V, I_S = 10A$			1.2	V
Reverse Recovery Time	$t_{rr}$	$T_J = 25^\circ\text{C}, I_F = 20A$ $di/dt = 500A/\mu\text{s}^1)$		45		nS
Reverse Recovery Charge	$Q_{rr}$			23		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

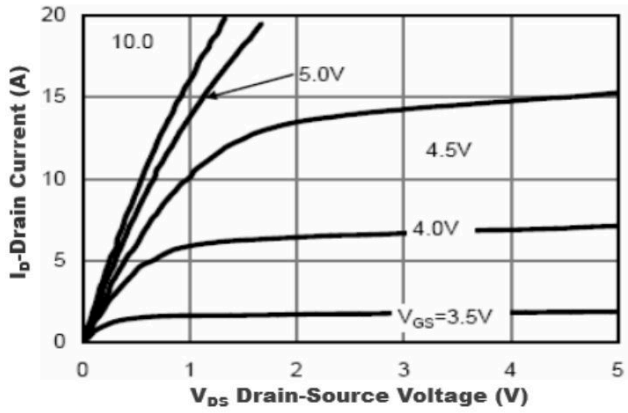


Figure1. Output Characteristics

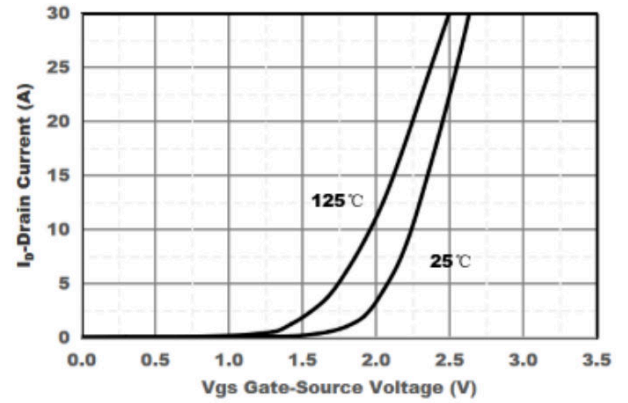


Figure2. Transfer Characteristics

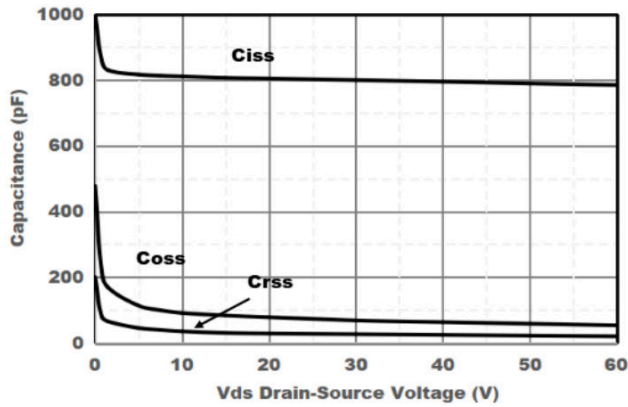


Figure3. Capacitance Characteristics

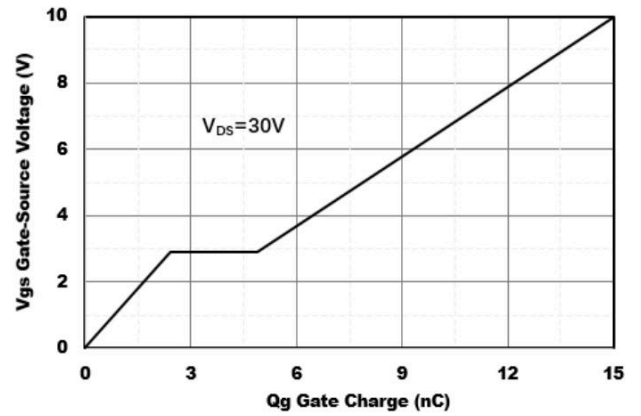


Figure4. Gate Charge

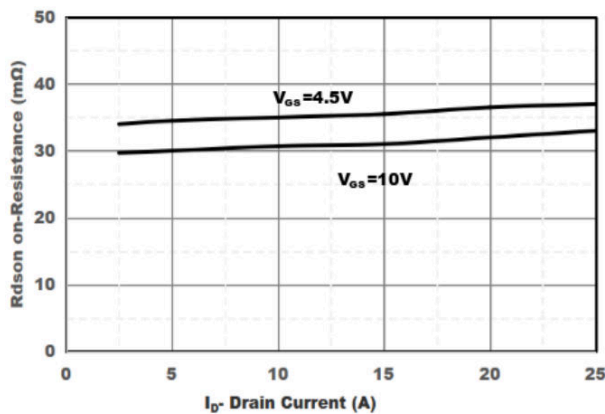


Figure5. Drain-Source on Resistance

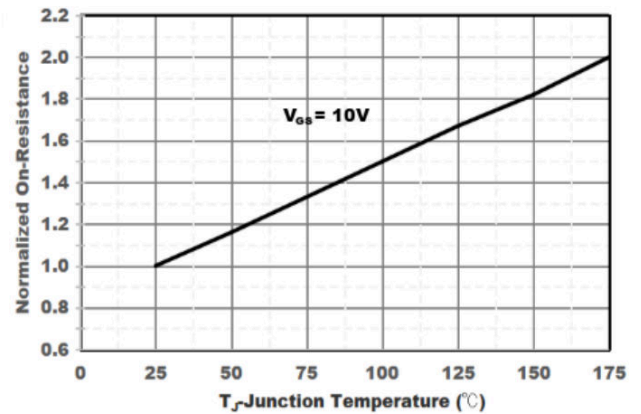
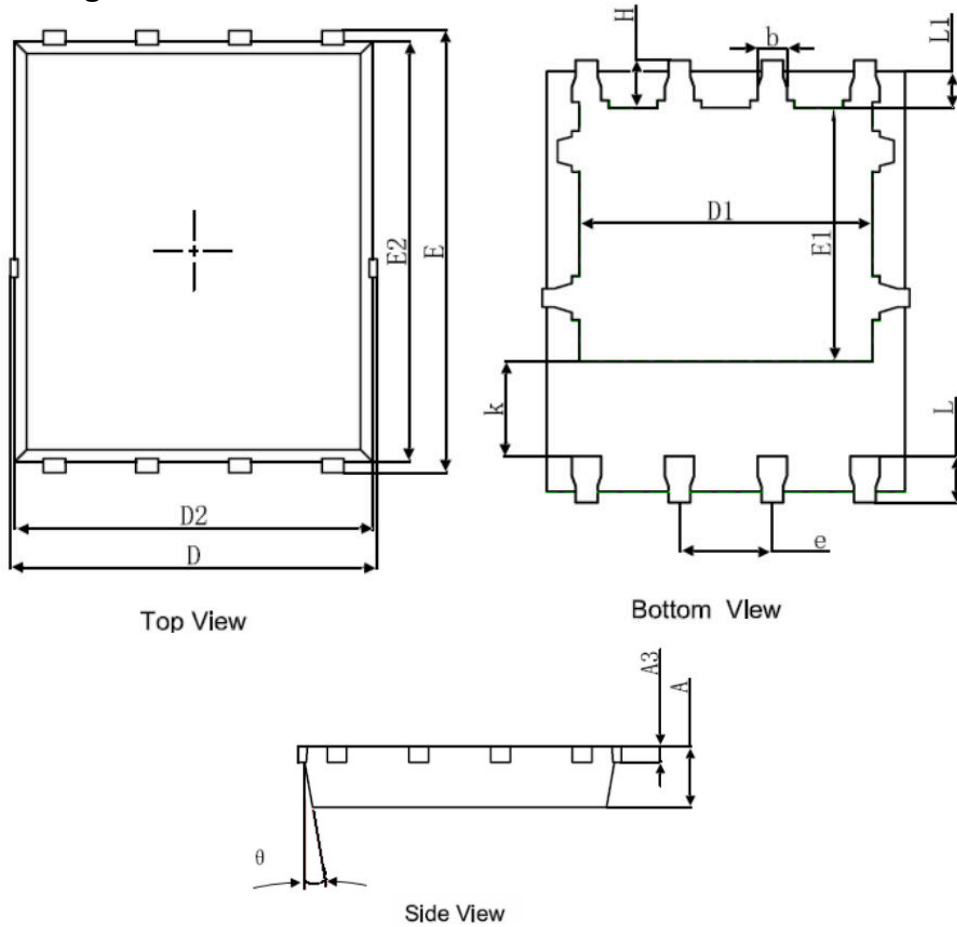


Figure6. Drain-Source on Resistance

### 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
$\theta$	8°	12°	8°	12°