

### Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D$
-20V	19mΩ@-4.5V	-30A
	22mΩ@-2.5V	
	30mΩ@-1.8V	

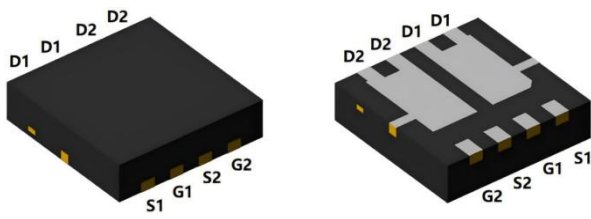
### Feature

- Trench power LV MOSFET technology
- High density cell design for Low  $R_{DS(ON)}$
- High speed switching

### Application

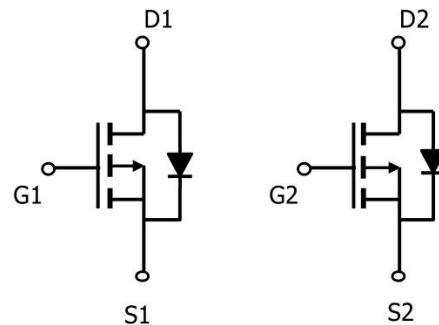
- Power management
- Battery protection
- Load switch

### Package

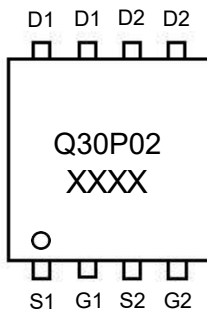


DFN3.3\*3.3-8L

### Circuit diagram



### Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	-20	V
Gate-Source Voltage	$V_{GS}$	$\pm 10$	V
Continuous Drain Current ( $T_C=25^{\circ}\text{C}$ )	$I_D$	-30	A
Continuous Drain Current ( $T_A=25^{\circ}\text{C}$ )		-10	A
Pulsed Drain Current <sup>1)</sup>	$I_{DM}$	-55	A
Single Pulse Avalanche Energy	$E_{AS}$	31	mJ
Power Dissipation <sup>2)</sup> ( $T_C=25^{\circ}\text{C}$ )	$P_D$	21	W
Thermal Resistance Junction to Case	$R_{\theta JC}$	5.9	$^{\circ}\text{C}/\text{W}$
Operating Junction Temperature	$T_J$	-55 ~ +150	$^{\circ}\text{C}$
Storage Temperature	$T_{STG}$	-55 ~ +150	$^{\circ}\text{C}$

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

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0\text{V}, I_D=-250\mu\text{A}$	-20			V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS}=-20\text{V}, V_{GS}=0\text{V}$			-1	$\mu\text{A}$
Gate-body leakage current	$I_{GSS}$	$V_{DS}=0\text{V}, V_{GS}=\pm 10\text{V}$			$\pm 100$	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu\text{A}$	-0.4	-0.61	-1	V
Drain-source on-resistance	$R_{DS(on)}$	$V_{GS}=-4.5\text{V}, I_D=-15\text{A}$		10.5	19	m $\Omega$
		$V_{GS}=-2.5\text{V}, I_D=-8\text{A}$		14.5	22	
		$V_{GS}=-1.8\text{V}, I_D=-6\text{A}$		20.5	30	
<b>Dynamic characteristics<sup>3)</sup></b>						
Input Capacitance	$C_{iss}$	$V_{DS}=-10\text{V}, V_{GS}=0\text{V}, f=1\text{MHz}$		3000		pF
Output Capacitance	$C_{oss}$			333		
Reverse Transfer Capacitance	$C_{rss}$			269		
Total Gate Charge	$Q_g$	$V_{DS}=-15\text{V}, V_{GS}=-10\text{V}$ $I_D=-9.1\text{A}$		72.4		nC
Gate-Source Charge	$Q_{gs}$			6.8		
Gate-Drain Charge	$Q_{gd}$			10		
Turn-on delay time	$t_{d(on)}$	$V_{DS}=-15\text{V}, V_{GS}=-10\text{V}$ $I_D=-6\text{A}, R_G=2.5\Omega$		7.5		nS
Turn-on rise time	$t_r$			32		
Turn-off delay time	$t_{d(off)}$			129		
Turn-off fall time	$t_f$			130		
<b>Source-Drain Diode characteristics</b>						
Diode Forward Current	$I_S$				-30	A
Diode Forward voltage	$V_{SD}$	$V_{GS}=0\text{V}, I_S=-30\text{A}$			-1.2	V
Reverse Recovery Time	$T_{rr}$	$I_F=-6\text{A}, di/dt=-100\text{A}/\mu\text{s}$		67		nS
Reverse Recovery Charge	$Q_{rr}$			34		nC

Notes:

- 1) Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty cycle  $\leq 2\%$ .
- 2)  $P_D$  is based on max. junction temperature, using junction-case and junction-ambient thermal resistance.
- 3) Guaranteed by design, not subject to production testing.

## Typical Characteristics

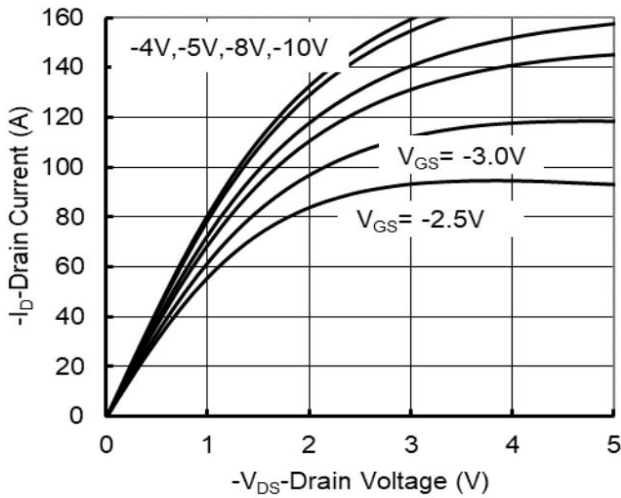


Figure 1. Output Characteristics

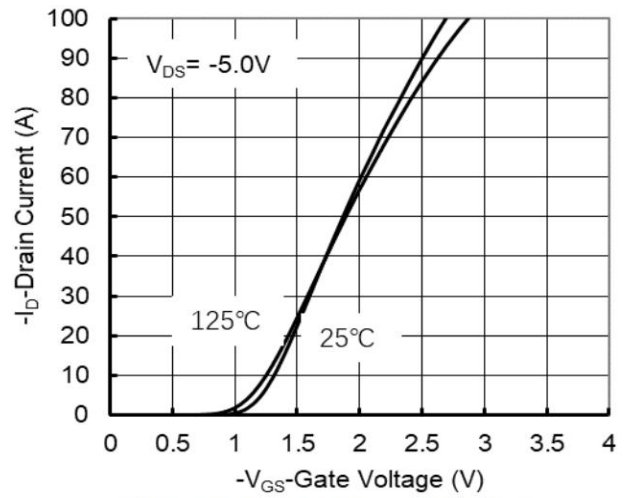


Figure 2. Transfer Characteristics

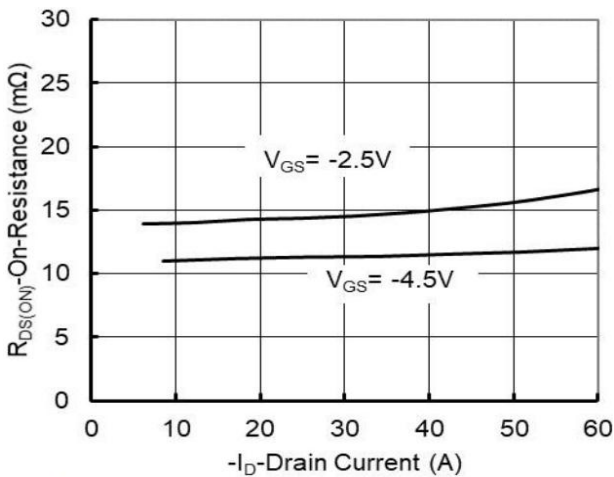


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

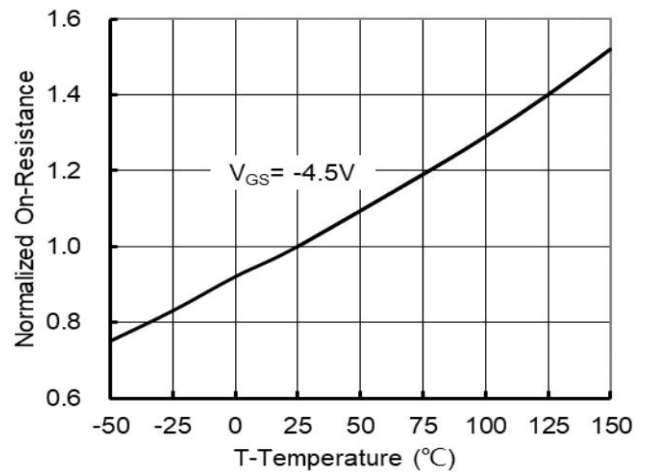


Figure 4. On-Resistance vs. Junction Temperature

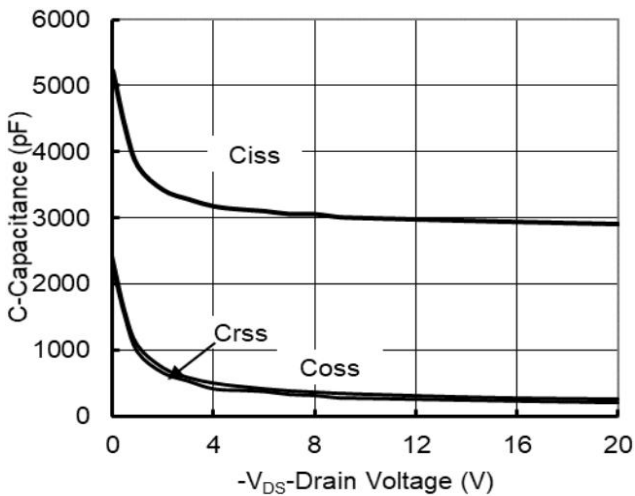


Figure 5. Capacitance Characteristics

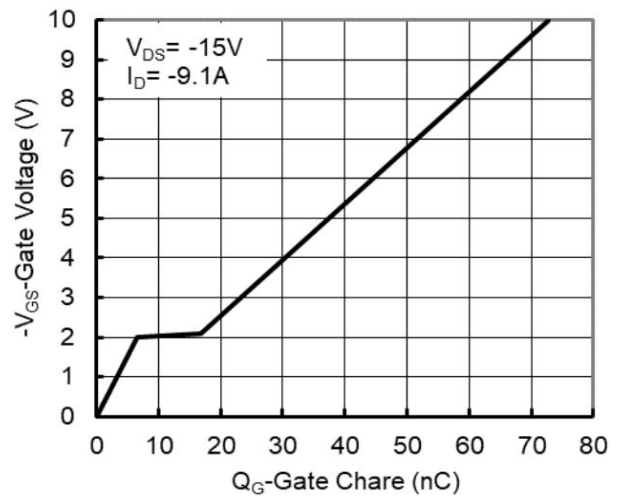


Figure 6. Gate Charge

## Typical Characteristics

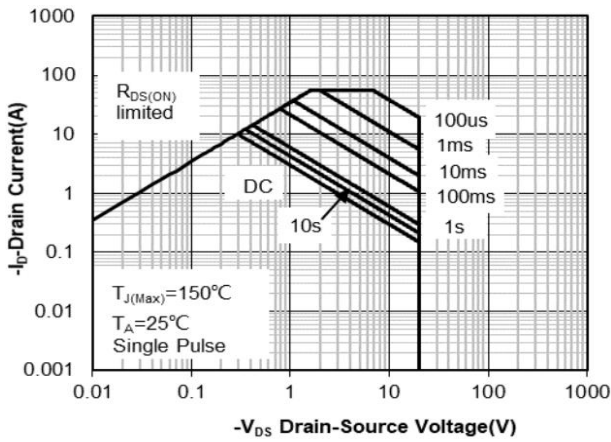


Figure 7. Safe Operation Area

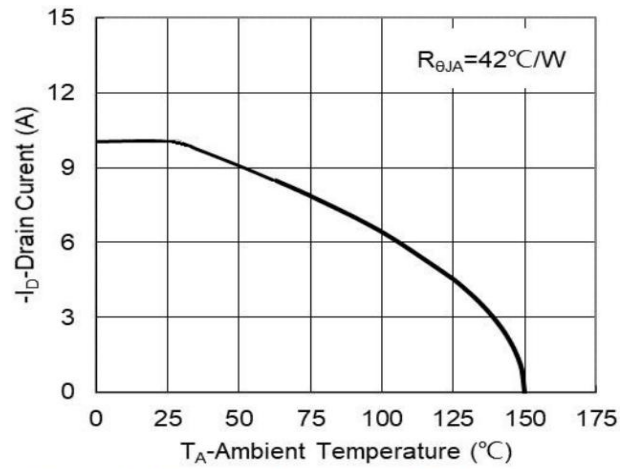


Figure 8. Maximum Continuous Drain Current vs Ambient Temperature

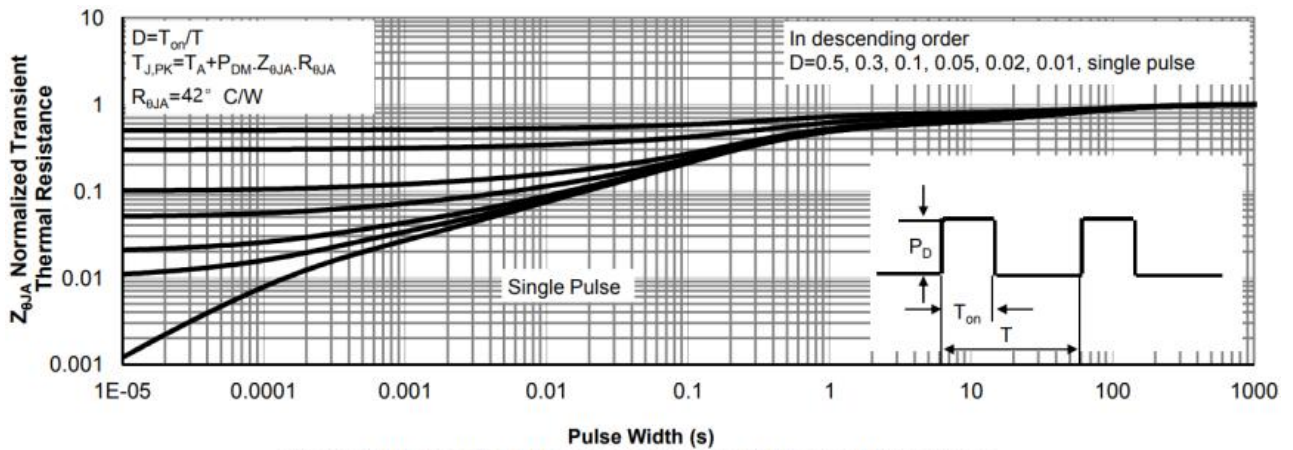
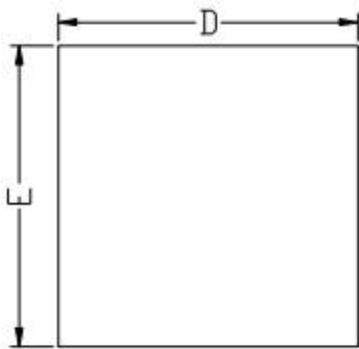
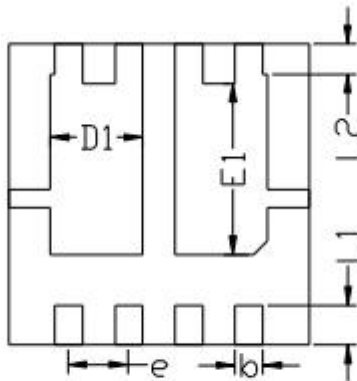


Figure 9. Normalized Maximum Transient Thermal Impedance

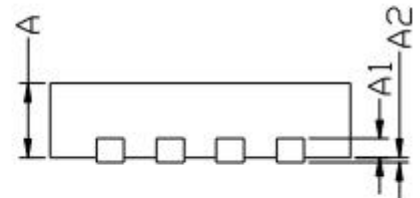
### DFN3.3\*3.3-8L Package Information



Top View



Bottom View



Side View

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
D	3.150	3.350	0.124	0.132
E	3.150	3.350	0.124	0.132
A	0.700	0.900	0.028	0.035
A1	0.200 BSC.		0.008 BSC.	
A2	0.000	0.100	0.000	0.004
D1	0.900	1.100	0.035	0.043
E1	1.750	1.950	0.069	0.077
L1	0.325	0.525	0.013	0.021
L2	0.325 BSC.		0.013 BSC.	
b	0.200	0.400	0.008	0.016
e	0.650 BSC.		0.026 BSC.	