

Product Summary

- V_{DS} 30 V
- I_D 50 A
- $R_{DS(ON)}$ (at $V_{GS} = 10V$) < 4.7 mohm
- $R_{DS(ON)}$ (at $V_{GS} = 4.5V$) < 6.0 mohm
- 100% UIS Tested
- 100% ∇V_{DS} Tested

Product Summary			
V_{DS}	$R_{DS(on)}$ (m Ω) Typ	I_D (A)	Q_g (Typ)
30V	3.9 @ 10V	50	55.7nc

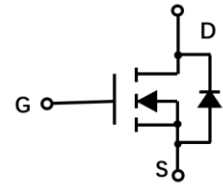
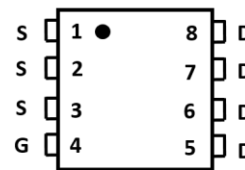
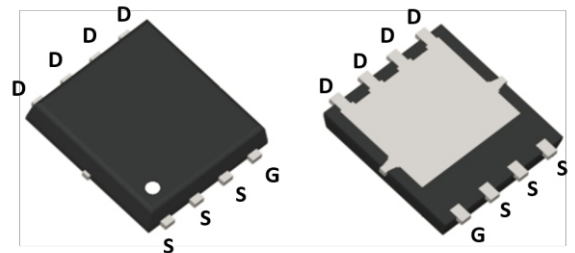
General Description

- Trench Power LV MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$

Application

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

DFN5060-8L



Mechanical Data

- Case:DFN5060-8L Package

Table1 Absolute Maximum Ratings ($T_c=25^\circ C$, unless otherwise specified)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	$T_c=25^\circ C$	50
		$T_c=100^\circ C$	35
Pulsed Drain Current (Note 1)	I_{DM}	190	A
Single Pulse Avalanche Energy (Note 2)	E_{AS}	80	mJ
Power Dissipation	P_D	$T_c=25^\circ C$	30
		$T_c=100^\circ C$	15
Operating Junction and Storage Temperature	T_J/T_{STG}	-55~+175	$^\circ C$

Table 2. Thermal Characteristics

Parameter	Symbol	Limit	Unit
Thermal resistance Junction to Case	$R_{\theta JC}$	5.0	$^{\circ}\text{C}/\text{W}$

Table 3. Electrical Characteristics ($T_J=25^{\circ}\text{C}$, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit	
Off Characteristics							
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu\text{A}$	30	-	-	V	
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=30V, V_{GS}=0V$	-	-	1	μA	
Gate- Source Leakage Current	Forward	I_{GSS}	$V_{GS}=20V, V_{DS}=0V$	-	-	100	nA
	Reverse	I_{GSS}	$V_{GS}=-20V, V_{DS}=0V$	-	-	-100	nA
On Characteristics(Note 4)							
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	1.0	1.5	2.5	V	
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=15A$	-	3.9	4.7	m Ω	
		$V_{GS}=4.5V, I_D=15A$	-	5.0	6.0		
Dynamic Characteristics(Note 5)							
Input Capacitance	C_{ISS}	$V_{DS}=15V, V_{GS}=0V, f=1\text{MHz}$	-	1620	-	pF	
Output Capacitance	C_{OSS}		-	336	-	pF	
Reverse Transfer Capacitance	C_{RSS}		-	195	-	pF	
Switching Characteristics (Note 5)							
Turn-On Delay Time	$t_d(on)$	$V_{DD}=20V, I_D=2A, V_{GS}=10V, R_G=3\Omega$	-	6	-	ns	
Turn-On Rise Time	t_R		-	36	-	ns	
Turn-Off Delay Time	$t_d(off)$		-	29	-	ns	
Turn-Off Fall Time	t_f		-	7	-	ns	
Total Gate Charge	Q_G	$V_{DS}=15V, I_D=20A, V_{GS}=10V$	-	55.7	-	nC	
Gate-Source Charge	Q_{GS}		-	13	-	nC	
Gate-Drain Charge	Q_{GD}		-	11.3	-	nC	
Drain-Source Diode Characteristics and Maximum Ratings							
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=15A$	-	0.85	1.2	V	
Maximum Continuous Drain-Source Diode Forward Current	I_S		-	-	50	A	
Reverse Recovery Time	t_{rr}	$V_{GS}=0V, I_F=25A$	-	29	-	ns	
Reverse Recovery Charge	Q_{RR}	$dI_F/dt=100A/\mu\text{s}$ (Note 1)	-	27	-	nC	

Notes : 1 Repetitive Rating: Pulse width limited by maximum junction temperature

2 $L=0.5\text{mH}, V_{DD}=20V, V_G=10V, R_G=25\Omega$, Starting $T_J=25^{\circ}\text{C}$

4 Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$

5 Guaranteed by design, not subject to production

Typical Test Circuit

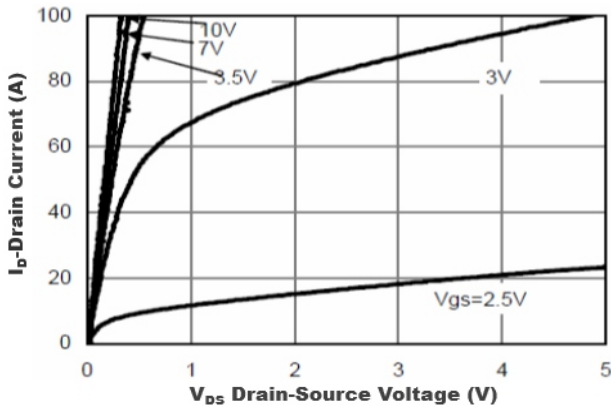


Figure1. Output Characteristics

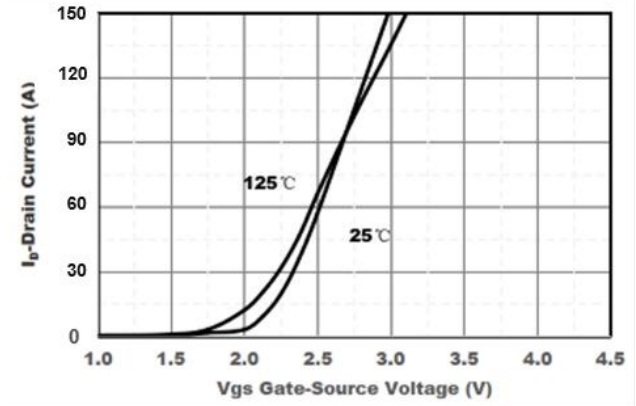


Figure2. Transfer Characteristics

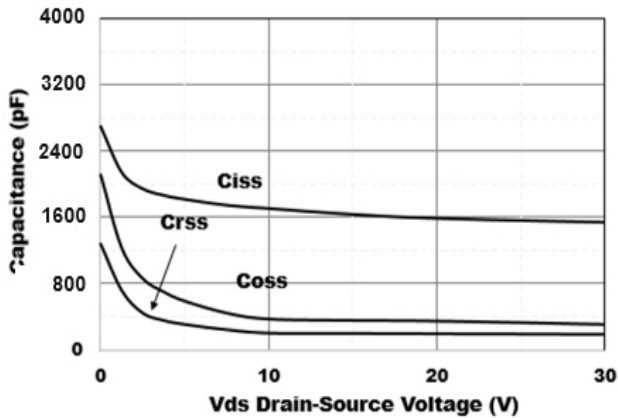


Figure3. Capacitance Characteristics

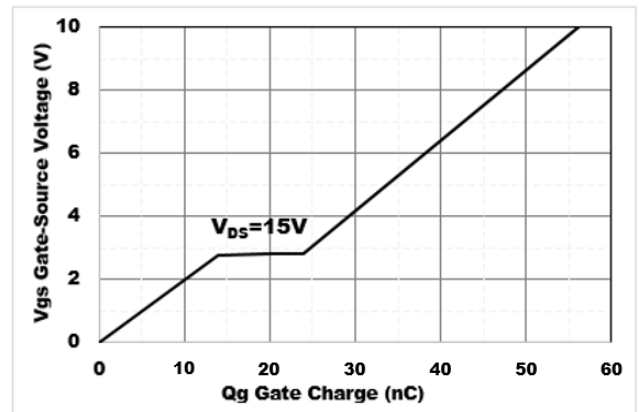


Figure4. Gate Charge

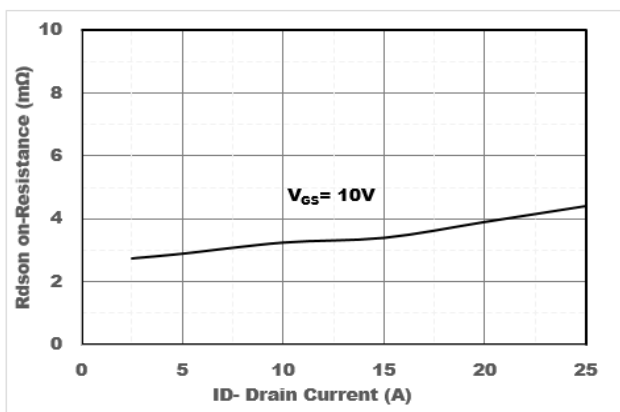


Figure5. Drain -Source on Resistance

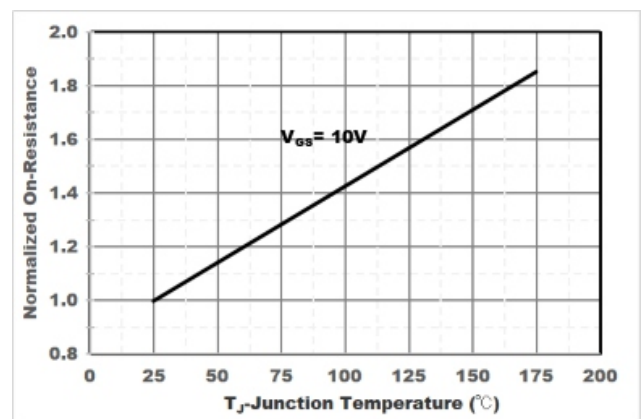


Figure6. Drain -Source on Resistance

Typical Test Circuit

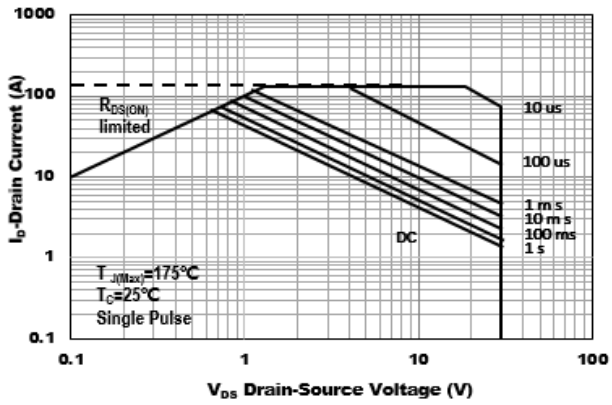


Figure7. Safe Operation Area

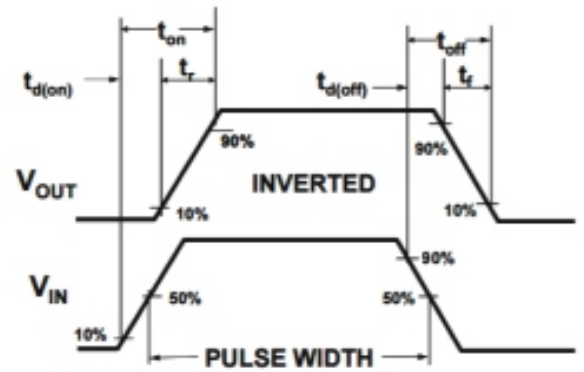
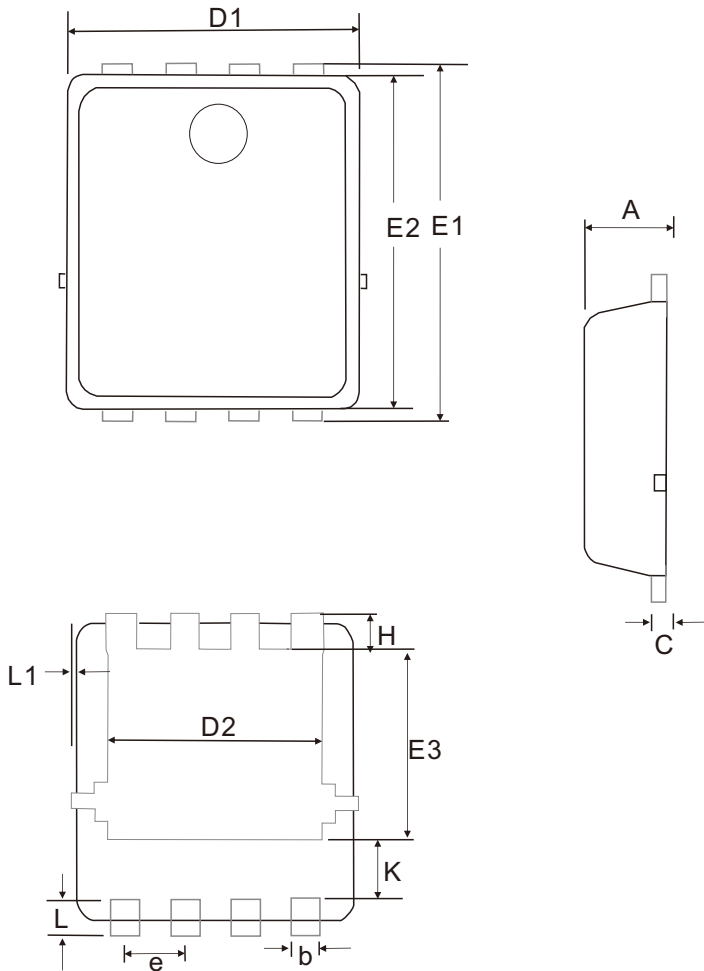


Figure8. Switching wave

Dimensions

DFN5060-8L PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions in millimeters	
	Min	Max
A	1.00	1.20
b	0.30	0.50
C	0.154	0.354
D1	5.00	5.40
D2	3.92	4.32
E1	5.95	6.35
E2	5.66	6.06
E3	3.52	3.92
e	1.17	1.37
L	0.00	0.12
L1	0.56	0.76
H	0.40	0.60
K	1.15	1.45

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