

## N-Channel 60V(D-S) MOSFET

### Product summary

$V_{DS}$	60	V
$R_{DS(ON)}$ (at $V_{GS}=10V$ ) Typ.	2.1	m $\Omega$
$I_D$ ( $T_C=25^{\circ}C$ )	95	A

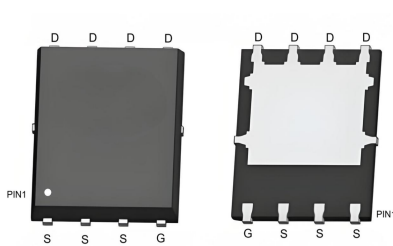
### Features

- High density cell design for low  $R_{DS(ON)}$
- Split Gate Trench MOSFET technology

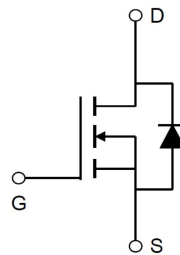
### Applications

- DC-DC Converters
- Power management functions

### Pin Configuration



PDFN5X6-8L



### Packing Information

Device	Package	Reel Size	Quantity(Min. Package)
ECAP95G06A	PDFN5X6-8L	13"	5000pcs

### Absolute Maximum Ratings (at $T_A=25^{\circ}C$ Unless Otherwise Noted)

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	60	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D$	Continuous Drain Current <sup>A</sup>	$T_C=25^{\circ}C$	95
		$T_C=100^{\circ}C$	60
$I_{DM}$	Pulse Drain Current Tested <sup>B</sup>	390	A
$E_{AS}$	Single Pulse Avalanche Energy <sup>C</sup>	500	mJ
$P_D$	Power Dissipation <sup>D</sup>	120	W
$T_J, T_{STG}$	Junction and Storage Temperature Range	-55 to +175	$^{\circ}C$

### Thermal Characteristics

Symbol	Parameter	Typical	Units
$R_{\theta JA}$	Thermal Resistance-Junction to ambient <sup>E</sup>	20	$^{\circ}C/W$
$R_{\theta JC}$	Thermal Resistance-Junction to case max	1.04	$^{\circ}C/W$

**Electrical Characteristics (at  $T_J = 25^\circ\text{C}$  Unless Otherwise Noted)**

Symbol	Parameter	Condition	Min.	Typ.	Max.	Units
<b>Static Parameters</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	60	--	--	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=60V, V_{GS}=0V$	--	--	1	$\mu A$
$I_{GSS}$	Gate-Body Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$	--	--	$\pm 100$	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1.2	1.8	2.2	V
$R_{DS(on)}$	Drain-Source On-State Resistance	$V_{GS}=10V, I_D=20A$	--	2.1	2.5	m $\Omega$
		$V_{GS}=4.5V, I_D=15A$	--	2.7	3.4	m $\Omega$
$V_{SD}$	Diode Forward Voltage	$I_S=20A, V_{GS}=0V$	--	--	1.2	V
$I_S$	Maximum Body-Diode Continuous Current		--	--	95	A
<b>Dynamic Parameters <sup>F</sup></b>						
$C_{iss}$	Input Capacitance	$V_{GS}=0V, V_{DS}=25V$ $f=100\text{KHZ}$	--	5950	--	pF
$C_{oss}$	Output Capacitance		--	1250	--	pF
$C_{rss}$	Reverse Transfer Capacitance		--	85	--	pF
$Q_g$	Total Gate Charge	$V_{DS}=50V, I_D=50A$ $V_{GS}=10V$	--	93	--	nC
$Q_{gs}$	Gate-Source Charge		--	17	--	nC
$Q_{gd}$	Gate-Drain Charge		--	14	--	nC
$t_{D(on)}$	Turn-on Delay Time	$V_{DD}=30V$ $I_D=25A, R_G=2\Omega,$ $V_{GS}=10V$	--	22.5	--	ns
$t_r$	Turn-on Rise Time		--	6.7	--	ns
$t_{D(off)}$	Turn-off Delay Time		--	80.3	--	ns
$t_f$	Turn-off Fall Time		--	26.9	--	ns
$t_{rr}$	Reverse recovery time	$I_F=25A,$ $di/dt=100\text{ A/uS}$	--	68	--	ns
$Q_{rr}$	Reverse recovery charge		--	73	--	nC

A. The maximum current rating is package limited.

B. Repetitive rating; pulse width limited by max. junction temperature.

C.  $V_{DD}=50V, R_G=25\Omega, L=0.5\text{mH}$ , starting  $T_J=25^\circ\text{C}$ .

D.  $P_D$  is based on max. junction temperature, using junction-case thermal resistance.

E. The value of  $R_{\theta JA}$  is measured with the device mounted on 1 in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_a=25^\circ\text{C}$ .

F. Guaranteed by design, not subject to production testing.

## Typical Characteristics

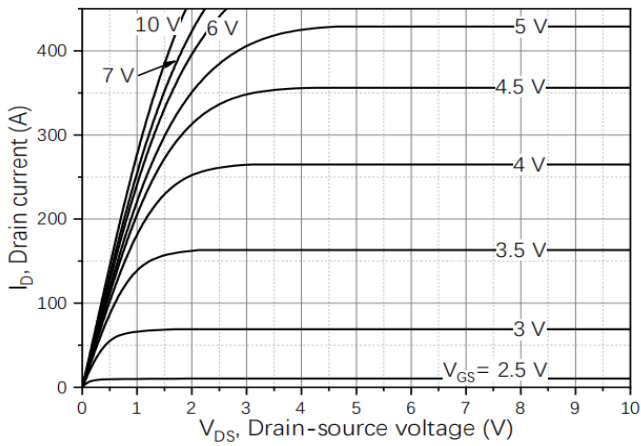


Figure1. Output Characteristics

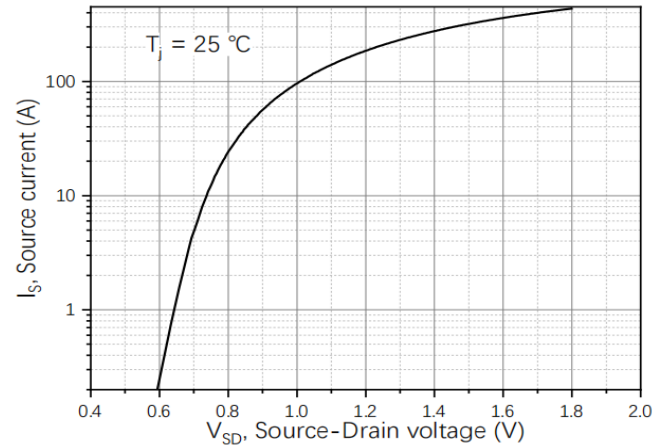


Figure2. Transfer Characteristics

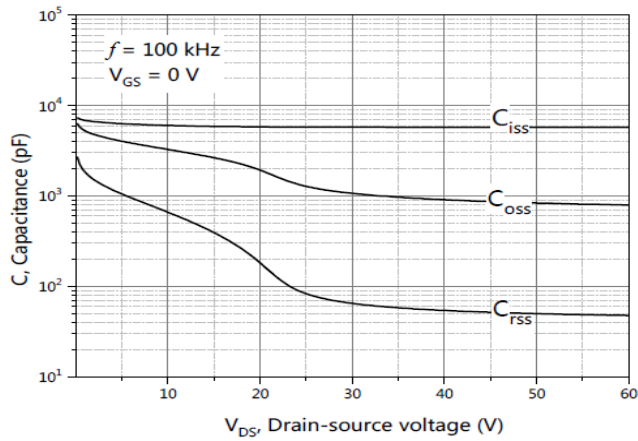


Figure3. Capacitance Characteristics

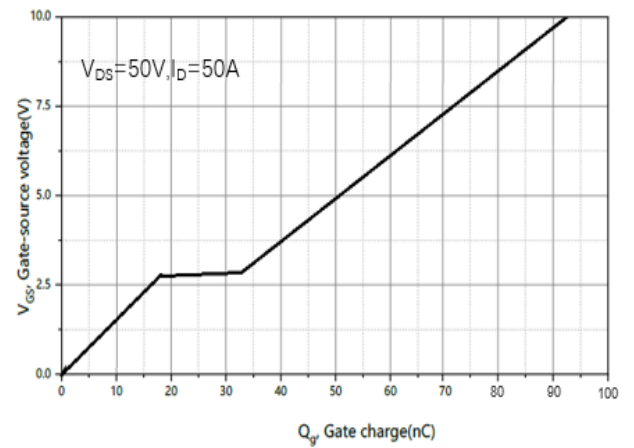


Figure4. Gate Charge

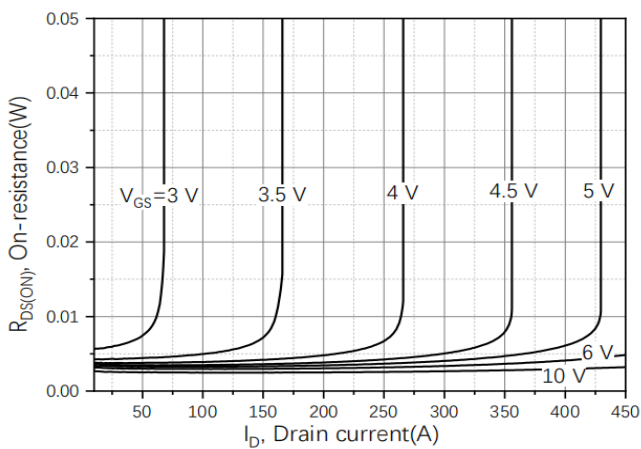


Figure5. Drain-Source on Resistance

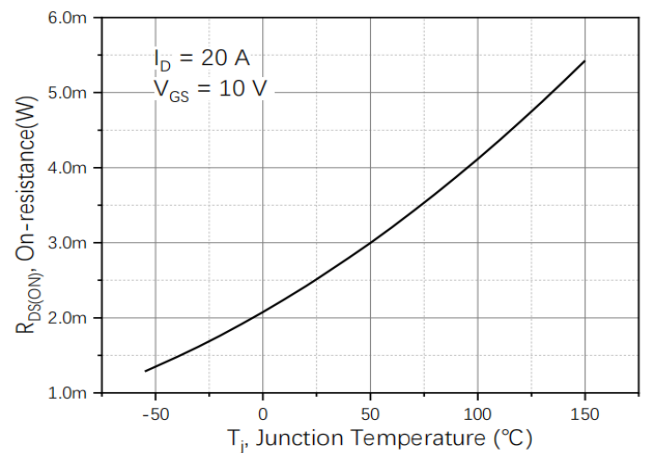


Figure6. Drain-Source on Resistance

## Typical Characteristics

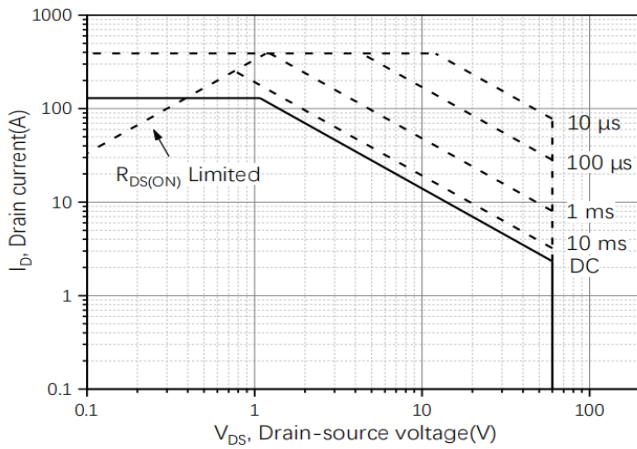


Figure7. Safe Operation Area

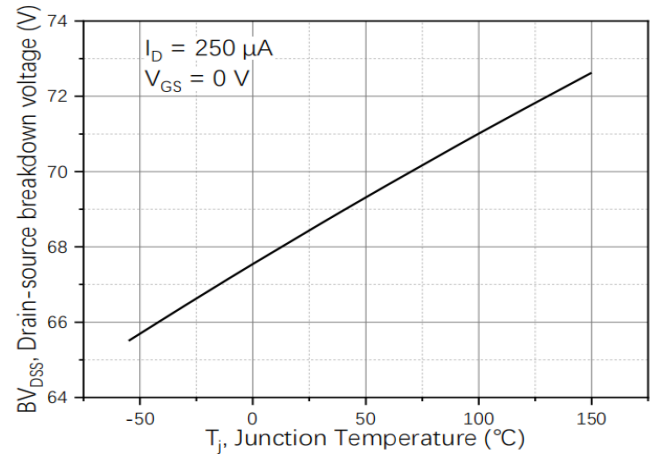


Figure8. Drain-source breakdown voltage

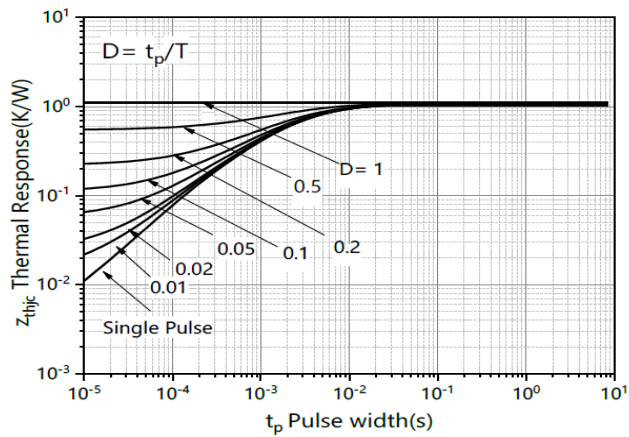


Figure 9. Transient thermal impedance

## Test circuits and waveforms

Figure A: Gate Charge Test Circuit & Waveforms

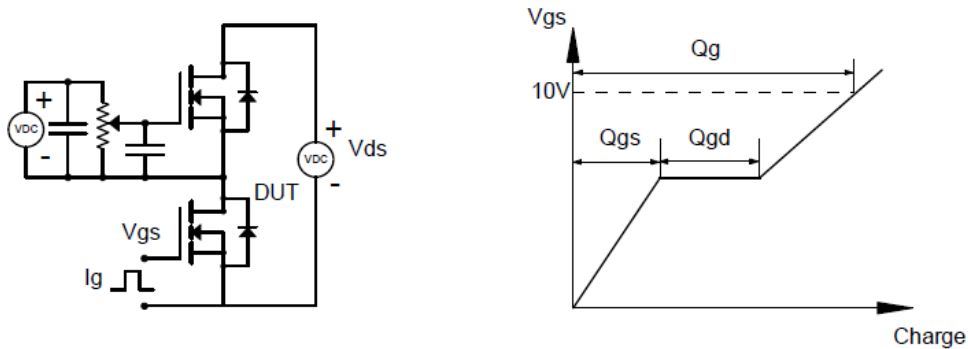


Figure B: Resistive Switching Test Circuit & Waveforms

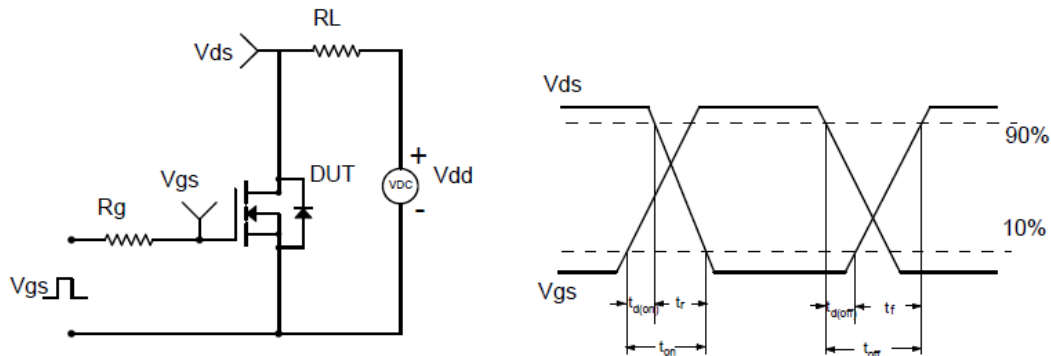


Figure C: Unclamped Inductive Switching (UIS) Test

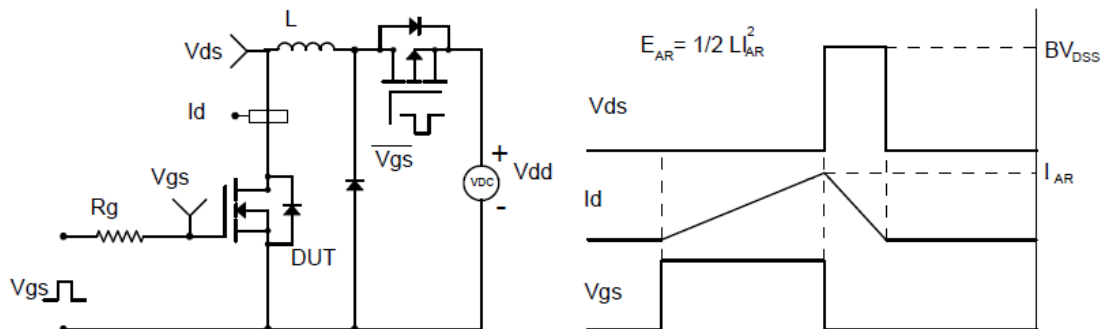
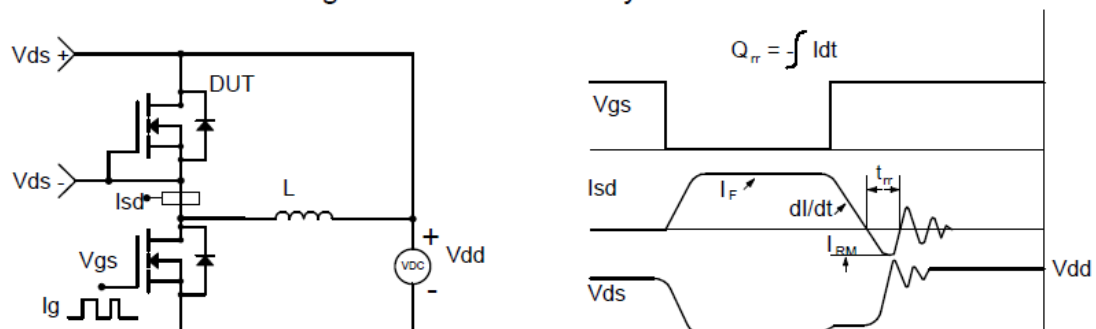
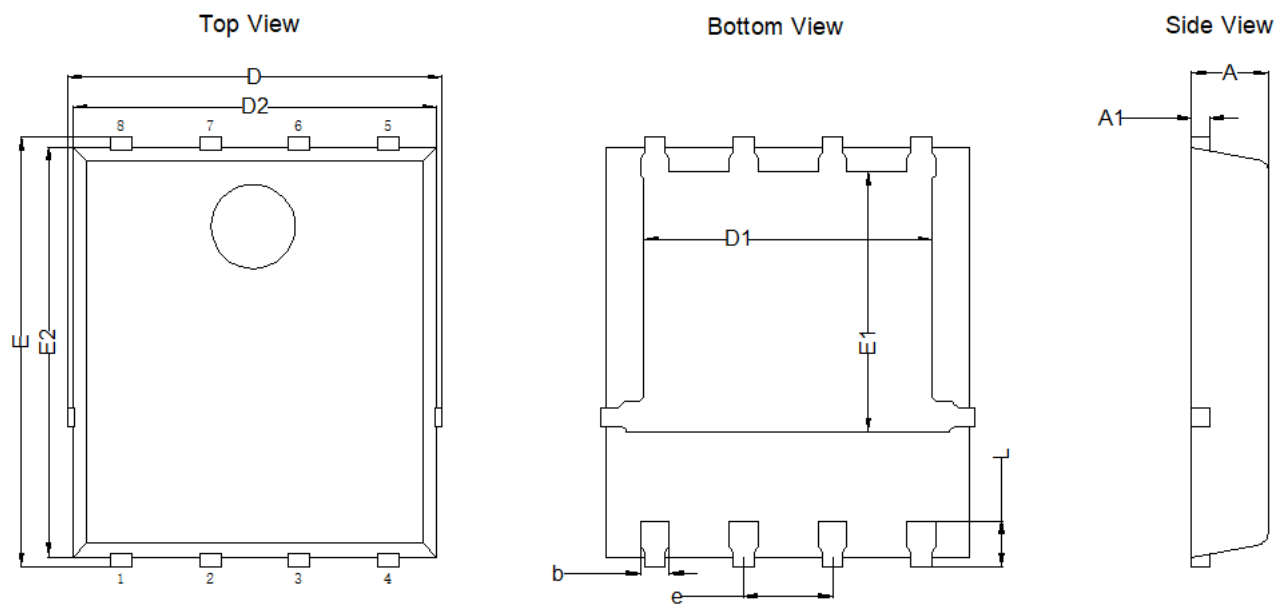


Figure D: Diode Recovery Test Circuit & Waveforms



## PDFN5X6-8L Package Information



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	1.00	1.10	1.20
A1	0.254 BSC		
D	5.15	5.35	5.55
E	5.95	6.15	6.35
D1	3.92	4.12	4.32
E1	3.52	3.72	3.92
D2	5.00	5.20	5.40
E2	5.66	5.86	6.06
e	1.27BSC		
b	0.31	0.41	0.51
L	0.56	0.66	0.76