

# FL3095K

## 30V N-channel enhancement mode MOSFET

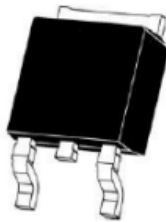
### Features

- Extremely Low RDS(on):  
Typ. RDS(on) = 3.5mΩ @ V<sub>GS</sub>=10 V, I<sub>d</sub>=40 A
- Good stability and uniformity
- 100% avalanche tested
- Excellent package for good heat dissipation

### General Description

The FL3095K uses advanced trench technology to provide excellent RDS(ON), low gate charge This device is suitable for use in UPS, power switching and general purpose applications.

TO-252-2L Package



Symbol	Parameter	Value	Units
V <sub>DS</sub>	Drain-Source Voltage	30	V
I <sub>D</sub>	Drain Current - Continuous (TC= 25°C) - Continuous (TC= 100°C)	90	A
		55*	A
I <sub>DM</sub>	Drain Current - Pulsed (Note 1)	180*	A
V <sub>GS</sub>	Gate-Source Voltage	± 20	V
E <sub>AS</sub>	Single Pulsed Avalanche Energy (Note 2)	320	mJ
P <sub>D</sub>	Power Dissipation (TC = 25°C) - Derate above 25°C	82	W
		0.53	W/°C
T <sub>j</sub> , T <sub>stg</sub>	Operating and Storage Temperature Range	-55 to +175	°C

\* Drain current limited by maximum junction temperature

### Thermal Characteristics

Symbol	Parameter	Value	Units
R <sub>θJC</sub>	Thermal Resistance, Junction-to-Case	1.83	°C/W

## Electrical Characteristics TC = 25°C unless otherwise noted

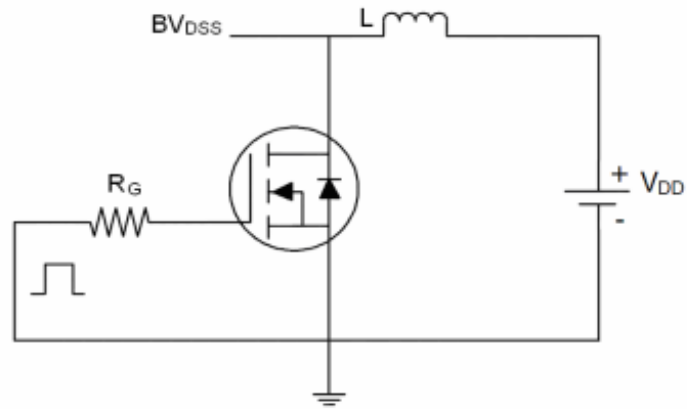
Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
<b>Off Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$	30			V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS} = 30\text{ V}, V_{GS} = 0\text{ V}$			1	$\mu\text{A}$
$I_{GSSF}$	Gate Leakage Current, Forward	$V_{GS} = 20\text{ V}, V_{DS} = 0\text{ V}$			100	nA
$I_{GSSR}$	Gate Leakage Current, Reverse	$V_{GS} = -20\text{ V}, V_{DS} = 0\text{ V}$			-100	nA
<b>On Characteristics</b>						
$V_{GS(TH)}$	Gate Threshold voltage	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$	1	1.6	2.5	V
$R_{DS(on)}$	Drain-Source on-state resistance	$V_{GS} = 10\text{ V}, I_D = 40\text{ A}$		3.5	4.0	m $\Omega$
		$V_{GS} = 4.5\text{ V}, I_D = 24\text{ A}$		5.5	7	m $\Omega$
$g_{FS}$	Forward Transconductance	$V_{DS} = 5\text{ V}, I_D = 24\text{ A}$ (Note 3)	20			S
<b>Dynamic Characteristics</b>						
$C_{iss}$	Input capacitance	$V_{DS}=15\text{V}, V_{GS}=0\text{V},$ $F=1.0\text{Mhz}$		1663		pF
$C_{oss}$	Output capacitance			248		pF
$C_{riss}$	Reverse transfer capacitance			238		pF
<b>Switching Characteristics</b>						
$t_{d(on)}$	Turn On Delay Time	$V_{DD}=15\text{V}, I_D=20\text{A},$ $V_{GS}=10\text{V}, R_g=30\Omega$ (Note 3, 4)		35		ns
$t_r$	Rising Time			205		ns
$t_{d(off)}$	Turn Off Delay Time			74		ns
$t_f$	Fall Time			72		ns
$Q_g$	Total Gate Charge	$V_{DD}=15\text{V}, I_D=45\text{A},$ $V_{GS}=10\text{V}$ (Note 3, 4)		36		nC
$Q_{gs}$	Gate-Source Charge			5		nC
$Q_{gd}$	Gate-Drain Charge			9.2		nC
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
$I_S$	Maximum Continuous Drain-Source Diode Forward Current				90	A
$I_{SM}$	Maximum Pulsed Drain-Source Diode Forward Current				180	A
$V_{SD}$	Diode Forward Voltage	$V_{GS} = 0\text{ V}, I_S = 24\text{ A}$			1.2	V
$T_{rr}$	Reverse recovery time	$I_F=20\text{A}, di/dt=100\text{A}/\mu\text{S}$		28		ns
$Q_{rr}$	Reverse recovery charge			13		nC

### Notes:

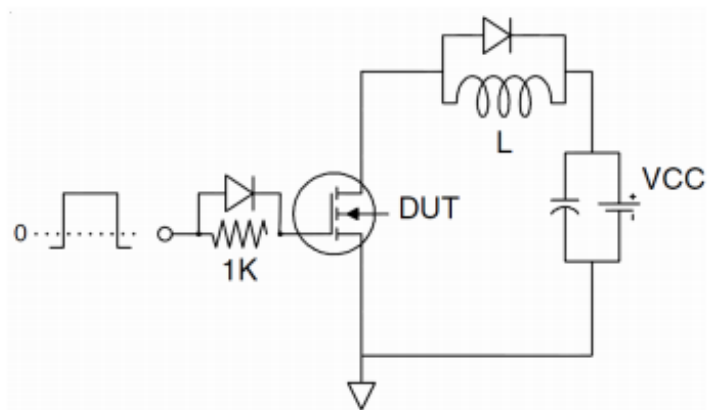
1. Repetitive Rating : Pulse width limited by maximum junction temperature
2.  $L = 0.5\text{ mH}, I_{AS} = 35\text{ A}, V_{DD} = 15\text{ V}, R_g = 25\ \Omega,$  Starting  $T_j = 25^\circ\text{C}$
3.  $I_{SD} \leq 40\text{ A}, di/dt = 100\text{ A}/\mu\text{s}, V_{DD} \leq BV_{DSS},$  Starting  $T_j = 25^\circ\text{C}$
4. Pulse Test : Pulse width  $\leq 300\ \mu\text{s},$  Duty cycle  $\leq 2\%$
5. Essentially independent of operating temperature

## Test Circuit

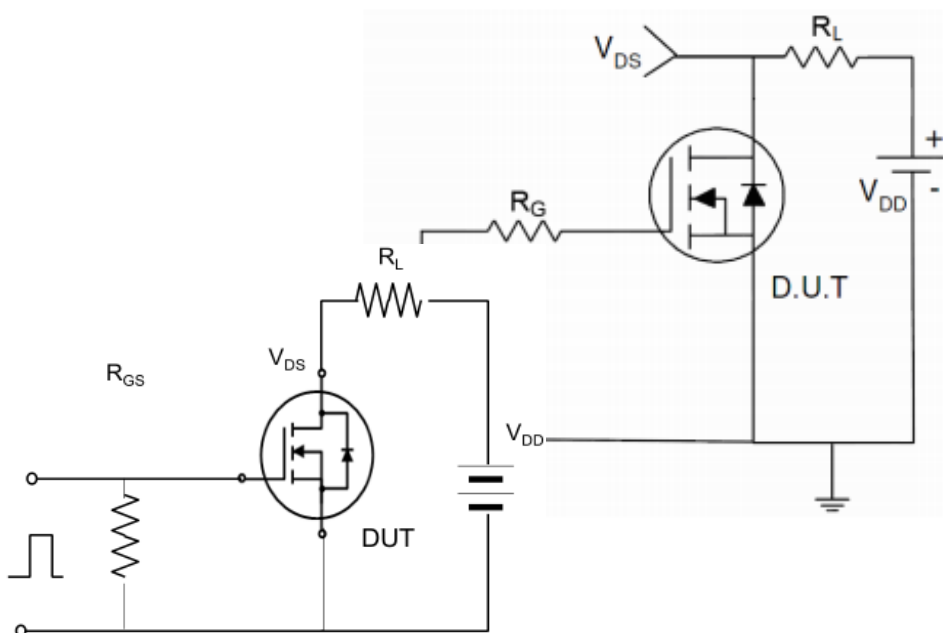
### 1) $E_{AS}$ Test Circuits



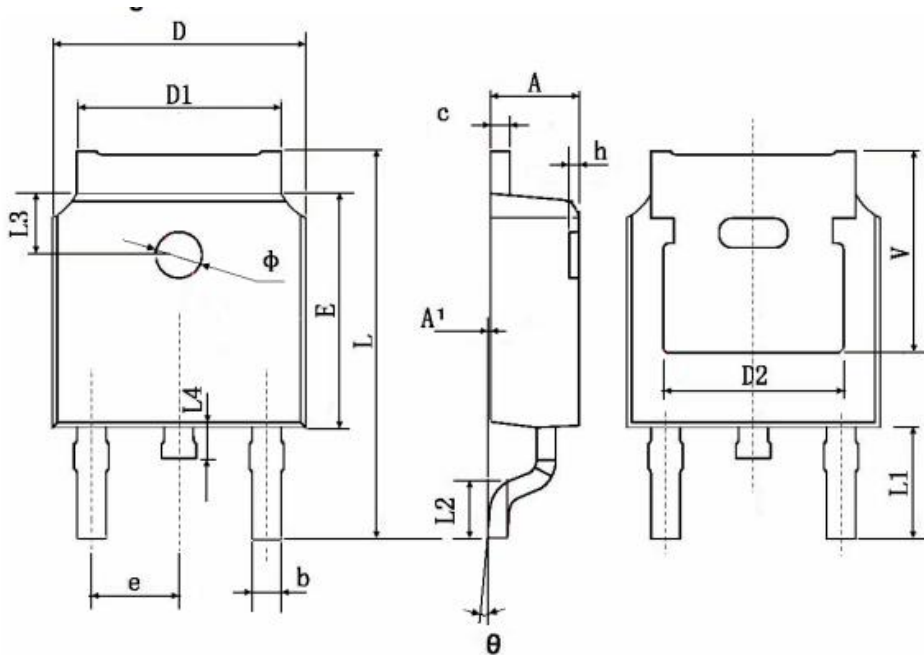
### 2) Gate Charge Test Circuit:



### 3) Switch Time Test Circuit:



## Package Dimensions : TO-252-2L PACKAGE



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.250	2.350	0.089	0.093
A1	0.050	0.150	0.002	0.006
b	0.660	0.860	0.026	0.034
c	0.458	0.558	0.018	0.022
D	6.550	6.650	0.259	0.263
D1	5.234	5.434	0.207	0.215
D2	4.826 TYP.		0.191 TYP.	
E	6.050	6.150	0.239	0.243
e	2.236	2.336	0.088	0.092
L	9.820	10.220	0.388	0.404
L1	3.000 TYP.		0.119 TYP.	
L2	1.400	1.600	0.055	0.063
L3	1.800 TYP.		0.071 TYP.	
L4	0.700	0.900	0.028	0.036
φ	1.150	1.250	0.045	0.049
θ	0°	3°	0°	3°
h	0.000	0.300	0.000	0.012
V	5.399 TYP		0.213 TYP	