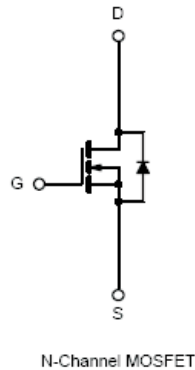
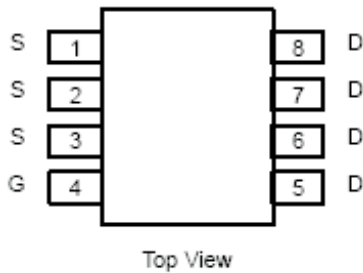
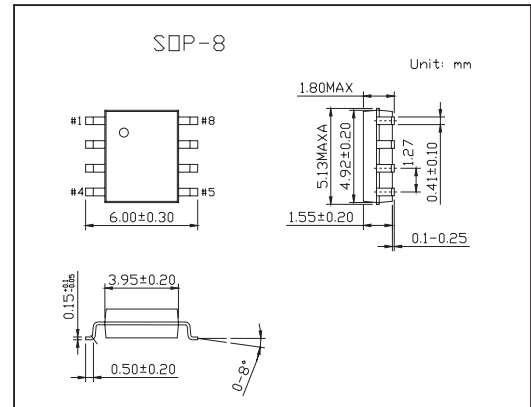


## N-Channel Qg, Fast Switching WFET™ KI4390DY

### ■ Features

- Extremely Low Qgd WFET Technology for Switching Losses
- TrenchFET™ Power MOSFET



### ■ Absolute Maximum Ratings Ta = 25°C

Parameter	Symbol	10 secs	Steady State	Unit
Drain-Source Voltage	V <sub>DS</sub>	30		V
Gate-Source Voltage	V <sub>GS</sub>	±20		
Continuous Drain Current (T <sub>J</sub> = 150 °C) T <sub>A</sub> = 25°C	I <sub>D</sub>	12.5	8.5	A
T <sub>A</sub> = 70°C		10	6.8	
Pulsed Drain Current	I <sub>DM</sub>	20		
Continuous Source Current ( Diode Conduction)*	I <sub>S</sub>	2.7	1.3	W
Maximum Power Dissipation *	P <sub>D</sub>	T <sub>A</sub> = 25°C	3	
		T <sub>A</sub> = 70°C	1.9	0.9
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-55 to 150		°C

\*Surface Mounted on 1" X 1" FR4 Board.

## KI4390DY

## ■ Thermal Resistance Ratings

Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient *	t ≤ 10 sec	R <sub>thJA</sub>	32	42	°C/W
	Steady-State		68	90	
Maximum Junction-to-Foot (Drain)	Steady-State	R <sub>thJF</sub>	15	20	

\* Surface Mounted on 1" X 1" FR4 Board.

## ■ Electrical Characteristics Ta = 25°C

Parameter	Symbol	Testconditions	Min	Typ	Max	Unit
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 μA	0.8		2.8	V
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±20 V			±100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 24 V, V <sub>GS</sub> = 0 V			1	μA
		V <sub>DS</sub> = 24 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 55°C			5	
On-State Drain Current*	I <sub>D(on)</sub>	V <sub>DS</sub> ≥ 5 V, V <sub>GS</sub> = 10 V	30			A
Drain Source On State Resistance*	r <sub>DS(on)</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 12.5 A		0.0075	0.0095	Ω
		V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 10.5 A		0.0105	0.0135	
Forward Transconductance	g <sub>fs</sub>	V <sub>DS</sub> = 15 V, I <sub>D</sub> = 12.5 A		38		S
Schottky Diode Forward Voltage*	V <sub>SD</sub>	I <sub>S</sub> = 2.7 A, V <sub>GS</sub> = 0 V		0.7		V
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = 15 V, V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 12.5 A		10	15	nC
Gate-Source Charge	Q <sub>gs</sub>			3.5		
Gate-Drain Charge	Q <sub>gd</sub>			2.1		
Gate Resistance	R <sub>g</sub>			0.8		Ω
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> =15V, R <sub>L</sub> =15 Ω, I <sub>D</sub> =1A, V <sub>GEN</sub> =10V, R <sub>G</sub> =6 Ω		16	30	ns
Rise Time	t <sub>r</sub>			6	12	
Turn-Off Delay Time	t <sub>d(off)</sub>			43	70	
Fall Time	t <sub>f</sub>			14	25	
Source-Drain Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 2.7 A, di/dt = 100 A/μs		35	60	ns

\* Pulse test :Pulse width ≤300 μs, duty cycle ≤2%