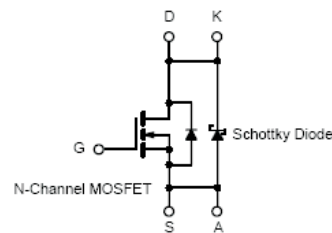
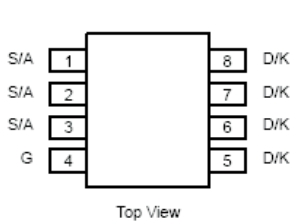
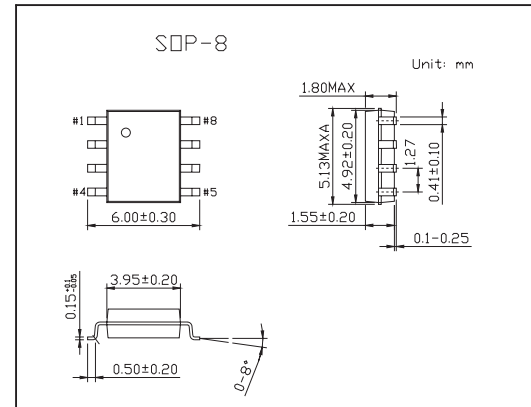


## N-Channel 30-V (D-S), Reduced Qg Fast Switching MOSFET with Schottky Diode KI4300DY

### ■ Features

- TrenchFET Power MOSFET
- LITTLE FOOT Plus™ Integrated Schottky
- PWM Optimized



### ■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

Parameter	Symbol	10 secs	Steady State	Unit
Drain-Source Voltage (MOSFET)	$V_{DS}$	30		V
Reverse Voltage (Schottky)	$V_{DA}$	30		
Gate-Source Voltage	$V_{GS}$	$\pm 20$		
Continuous Drain Current ( $T_J = 150^\circ\text{C}$ ) $T_A = 25^\circ\text{C}$ (MOSFET)* $T_A = 70^\circ\text{C}$	$I_D$	9 7	6.4 5.1	A
Pulsed Drain Current (MOSFET)	$I_{DM}$	40		
Continuous Source Current (MOSFET Diode Conduction)*	$I_S$	2.3	1.25	
Average Forward Current (Schottky)	$I_F$	2.3	1.25	
Pulsed Forward Current (Schottky)	$I_{FM}$	20		
Maximum Power Dissipation (MOSFET)* $T_A = 25^\circ\text{C}$ $T_A = 70^\circ\text{C}$	$P_D$	2.5	1.38	W
Maximum Power Dissipation (Schottky)* $T_A = 25^\circ\text{C}$ $T_A = 70^\circ\text{C}$		1.6	0.88	
		2.2	1.25	
		1.4	0.8	
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 to 150		$^\circ\text{C}$

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

## KI4300DY

## ■ Thermal Resistance Ratings

Parameter	Symbol	MOSFET		Schottky		Unit	
		Typ	Max	Typ	Max		
Maximum Junction-to-Ambient *	t ≤ 10 sec	R <sub>thJA</sub>	40	50	45	55	°C/W
	Steady-State		70	90	78	100	
Maximum Junction-to-Foot (Drain)	Steady-State	R <sub>thJF</sub>	18	23	25	30	

\* 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			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			100	μA
		V <sub>DS</sub> = 24 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 85°C			2000	
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> = 9 A		0.0155	0.0185	Ω
		V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 7 A		0.0275	0.033	
Forward Transconductance	g <sub>fs</sub>	V <sub>DS</sub> = 15 V, I <sub>D</sub> = 9 A		16		S
Schottky Diode Forward Voltage*	V <sub>SD</sub>	I <sub>S</sub> = 1.0 A, V <sub>GS</sub> = 0 V		0.47	0.5	V
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = 15 V, V <sub>GS</sub> = 5 V, I <sub>D</sub> = 9 A		8.7	13	nC
Gate-Source Charge	Q <sub>gs</sub>			2.25		
Gate-Drain Charge	Q <sub>gd</sub>			4.2		
Gate Resistance	R <sub>g</sub>		0.5		2.7	Ω
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> =15V,RL=15Ω, I <sub>D</sub> =1A,V <sub>GEN</sub> =10V,R <sub>G</sub> =6Ω		11	16	ns
Rise Time	t <sub>r</sub>			8	15	
Turn-Off Delay Time	t <sub>d(off)</sub>			22	30	
Fall Time	t <sub>f</sub>			9	15	
Source-Drain Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 2.3 A, di/dt = 100 A/μs		32	60	ns
Forward Voltage Drop	V <sub>F</sub>	I <sub>F</sub> = 1.0 A		0.47	0.5	V
		I <sub>F</sub> = 1.0 A, T <sub>J</sub> = 125°C		0.36	0.42	V
Maximum Reverse Leakage Current	I <sub>rm</sub>	V <sub>r</sub> = 24 V		0.004	0.100	mA
		V <sub>r</sub> = 24 V, T <sub>J</sub> = 100°C		0.7	10	
		V <sub>r</sub> = -24 V, T <sub>J</sub> = 125°C		3.0	20	
Junction Capacitance	C <sub>T</sub>	V <sub>r</sub> = 10 V		50		pF

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