N- and P-Channel 20-V (D-S) MOSFET
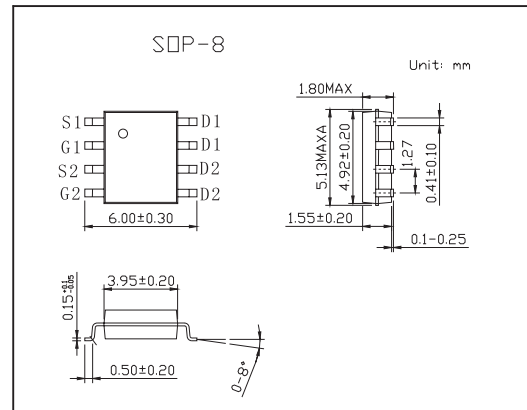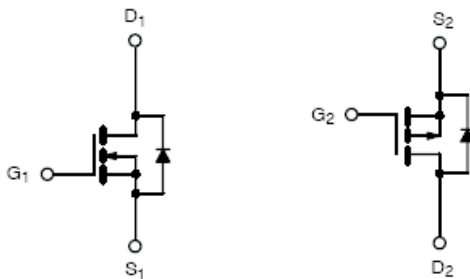
KI4511DY

■ Features

● TrenchFET Power MOSFET

SOP-8

■ Absolute Maximum Ratings T$_A$ = 25℃

Parameter	Symbol	N-Channel		P-Channel		Unit
		10 sec	Steady State	10 sec	Steady State	
Drain-Source Voltage	V$_{DS}$	20		-20		V
Gate-Source Voltage	V$_{GS}$	±16		±12		V
Continuous Drain Current (T$_J$ = 150℃)* T$_A$ = 25℃	I$_D$	9.6	7.2	-6.2	-4.6	A
T$_A$ = 70℃		7.7	5.8	-4.9	-3.7	A
Pulsed Drain Current	I$_{DM}$	40		-40		A
Continuous Source Current (Diode Conduction)*	I$_S$	1.7	0.9	-1.7	0.9	A
Maximum Power Dissipation* T$_A$ = 25℃	P$_D$	2	1.1	2	1.1	W
T$_A$ = 70℃		1.3	0.7	1.3	0.7	W
Operating Junction and Storage Temperature Range	T$_J$, T$_{stg}$	-55 to 150				℃

*Surface Mounted on FR4 Board;t ≤ 10 sec.

■ Thermal Resistance Ratings T$_A$ = 25℃

Parameter		Symbol	N-Channel		P-Channel		Unit
			Typ	Max	Typ	Max	
Maximum Junction-to-Ambient*	t ≤10 sec	R$_{thJA}$	50	62.5	50	62.5	℃/W
	Steady State		85	110	90	110	
Maximum Junction-to-Foot	Steady State	R$_{thJc}$	30	40	30	35	

*Surface Mounted on FR4 Board.

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■ Electrical Characteristics TJ = 25℃

Parameter	Symbol	Testconditons		Min	Typ	Max	Unit
Gate Threshold Voltage	VGS(th)	VDS = VGS, ID = 250 μA	N-Ch	0.6		1.8	V
		VDS = VGS, ID = -250 μA	P-Ch	-0.6		1.4	
Gate Body Leakage	IGSS	VDS = 0 V VGS =±16 V	N-Ch			±100	nA
		VDS = 0 V VGS =±12 V	P-Ch			±100	
Zero Gate Voltage Drain Current	IDSS	VDS = 20V, VGS = 0 V	N-Ch			1	nA
		VDS = -16V, VGS = 0 V	P-Ch			-1	
		VDS = 20 V, VGS = 0 V, TJ = 55℃	N-Ch			5	μA
		VDS = -16V, VGS = 0 V, TJ = 55℃	P-Ch			-5	
On State Drain Currenta	ID(on)	VDS =5 V, VGS = 10 V	N-Ch	40			A
		VDS =-5 V, VGS = -4.5 V	P-Ch	-40			
Drain Source On State Resistance*	rDS(on)	VGS = 10 V, ID = 9.6A	N-Ch		0.0115	0.0145	Ω
		VGS = -4.5 V, ID = -6.2A	P-Ch		0.022	0.033	
		VGS = 4.5 V, ID = 8.6A	N-Ch		0.0135	0.017	
		VGS = -2.5 V, ID = -5A	P-Ch		0.035	0.050	
Forward Transconductance*	gfs	VDS = 15 V, ID = 9.6A	N-Ch		33		S
		VDS = -15 V, ID = -6.2A	P-Ch		17		
Diode Forward Voltage*	VSD	IS = 1.7A, VGS = 0 V	N-Ch		0.8	1.2	V
		IS = -1.7A, VGS = 0 V	P-Ch		?0.8	-1.2	
Total Gate Charge	Qg	N-Channel	N-Ch		11.5	18	nC
		VDS = 10 V, VGS = 4.5V, ID = 9.6A	P-Ch		17	20	
Gate Source Charge	Qgs		N-Ch		3.7		
		P-Channel	P-Ch		4.1		
Gate Drain Charge	Qgd	VDS = -10 V, VGS = -4.5 V, ID = -6.2A	N-Ch		3.3		
			P-Ch		4.3		
Turn On Time	td(on)	N Channel	N-Ch		12	20	ns
		VDD = 10 V, RL = 10 Ω	P-Ch		25	40	
Rise Time	tr	ID= 1A, VGEN = 10V, Rg = 6 Ω	N-Ch		12	20	
			P-Ch		30	45	
Turn Off Delay Time	td(off)	P-Channel	N-Ch		55	85	
		VDD = -10 V, RL = 10 Ω	P-Ch		70	105	
Fall Time	tf	ID= -1 A, VGEN = -4.5 V, Rg = 6 Ω	N-Ch		15	25	
			P-Ch		50	75	
Source-Drain Reverse Recovery Time	trr	IF = 1.7 A, di/dt = 100 A/μs	N-Ch		50	100	
		IF = -1.7 A, di/dt = 100 A/μs	P-Ch		40	80	

* Pulse test; pulse width ≤300μs, duty cycle≤2%.