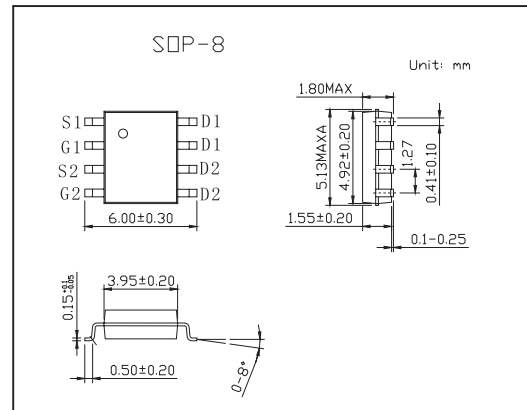
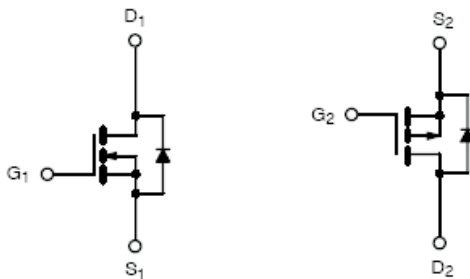


N- and P-Channel 20-V (D-S) MOSFET

KI4511DY

■ Features

- TrenchFET Power MOSFET

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

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 ($T_J = 150^\circ\text{C}$)* $T_A = 25^\circ\text{C}$	I_D	9.6	7.2	-6.2	-4.6	A
		$T_A = 70^\circ\text{C}$		7.7	5.8	-4.9
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*	P_D	$T_A = 25^\circ\text{C}$		2	1.1	W
		$T_A = 70^\circ\text{C}$		1.3	0.7	W
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to 150				$^\circ\text{C}$

*Surface Mounted on FR4 Board; $t \leq 10$ sec.

■ Thermal Resistance Ratings $T_A = 25^\circ\text{C}$

Parameter	Symbol	N-Channel		P-Channel		Unit	
		Typ	Max	Typ	Max		
Maximum Junction-to-Ambient*	R_{thJA}	$t \leq 10$ sec	50	62.5	50	62.5	$^\circ\text{C}/\text{W}$
		Steady State	85	110	90	110	
Maximum Junction-to-Foot	R_{thJc}	30	40	30	35		

*Surface Mounted on FR4 Board.

KI4511DY

■ Electrical Characteristics $T_J = 25^\circ\text{C}$

Parameter	Symbol	Testconditions	Min	Typ	Max	Unit	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250 \mu\text{A}$	N-Ch	0.6		1.8	V
		$V_{DS} = V_{GS}, I_D = -250 \mu\text{A}$	P-Ch	-0.6		1.4	
Gate Body Leakage	I_{GSS}	$V_{DS} = 0\text{V}, V_{GS} = \pm 16\text{V}$	N-Ch			± 100	nA
		$V_{DS} = 0\text{V}, V_{GS} = \pm 12\text{V}$	P-Ch			± 100	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 20\text{V}, V_{GS} = 0\text{V}$	N-Ch			1	μA
		$V_{DS} = -16\text{V}, V_{GS} = 0\text{V}$	P-Ch			-1	
		$V_{DS} = 20\text{V}, V_{GS} = 0\text{V}, T_J = 55^\circ\text{C}$	N-Ch			5	
		$V_{DS} = -16\text{V}, V_{GS} = 0\text{V}, T_J = 55^\circ\text{C}$	P-Ch			-5	
On State Drain Currenta	$I_{D(on)}$	$V_{DS} = 5\text{V}, V_{GS} = 10\text{V}$	N-Ch	40			A
		$V_{DS} = -5\text{V}, V_{GS} = -4.5\text{V}$	P-Ch	-40			
Drain Source On State Resistance*	$r_{DS(on)}$	$V_{GS} = 10\text{V}, I_D = 9.6\text{A}$	N-Ch		0.0115	0.0145	Ω
		$V_{GS} = -4.5\text{V}, I_D = -6.2\text{A}$	P-Ch		0.022	0.033	
		$V_{GS} = 4.5\text{V}, I_D = 8.6\text{A}$	N-Ch		0.0135	0.017	
		$V_{GS} = -2.5\text{V}, I_D = -5\text{A}$	P-Ch		0.035	0.050	
Forward Transconductance*	g_{fs}	$V_{DS} = 15\text{V}, I_D = 9.6\text{A}$	N-Ch		33		S
		$V_{DS} = -15\text{V}, I_D = -6.2\text{A}$	P-Ch		17		
Diode Forward Voltage*	V_{SD}	$I_S = 1.7\text{A}, V_{GS} = 0\text{V}$	N-Ch		0.8	1.2	V
		$I_S = -1.7\text{A}, V_{GS} = 0\text{V}$	P-Ch		?0.8	-1.2	
Total Gate Charge	Q_g	N-Channel $V_{DS} = 10\text{V}, V_{GS} = 4.5\text{V}, I_D = 9.6\text{A}$	N-Ch		11.5	18	nC
Gate Source Charge	Q_{gs}	P-Channel $V_{DS} = -10\text{V}, V_{GS} = -4.5\text{V}, I_D = -6.2\text{A}$	N-Ch		3.7		
			P-Ch		4.1		
Gate Drain Charge	Q_{gd}		N-Ch		3.3		
			P-Ch		4.3		
Turn On Time	$t_{d(on)}$	N Channel $V_{DD} = 10\text{V}, R_L = 10\Omega$	N-Ch		12	20	ns
Rise Time	t_r	$I_D = 1\text{A}, V_{GEN} = 10\text{V}, R_g = 6\Omega$	P-Ch		25	40	
			N-Ch		12	20	
Turn Off Delay Time	$t_{d(off)}$	P-Channel $V_{DD} = -10\text{V}, R_L = 10\Omega$	N-Ch		55	85	
			P-Ch		70	105	
Fall Time	t_f	$I_D = -1\text{A}, V_{GEN} = -4.5\text{V}, R_g = 6\Omega$	N-Ch		15	25	
			P-Ch		50	75	
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = 1.7\text{A}, di/dt = 100\text{A}/\mu\text{s}$	N-Ch		50	100	
		$I_F = -1.7\text{A}, di/dt = 100\text{A}/\mu\text{s}$	P-Ch		40	80	

* Pulse test; pulse width $\leq 300 \mu\text{s}$, duty cycle $\leq 2\%$.