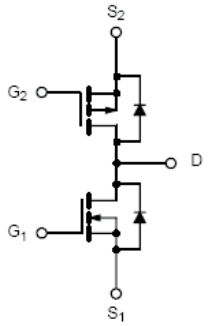
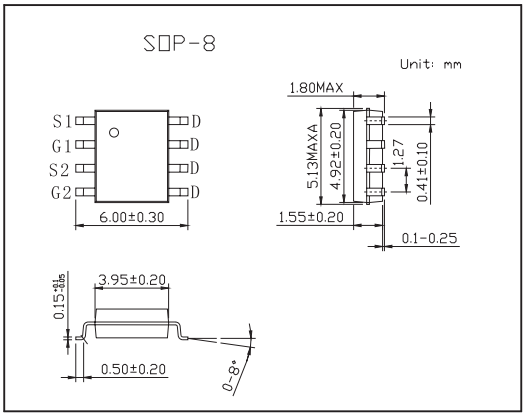
Complementary MOSFET Half-Bridge (N- and P-Channel)

KI4501DY

■ PIN Configuration





■ Absolute Maximum Ratings T_A = 25℃

Parameter	Symbol	N-Channel	P-Channel	Unit
Drain-Source Voltage	V_{DS}	30	-8	V
Gate-Source Voltage	V_{GS}	±20	±8	V
Continuous Drain Current (T_J = 150℃)* T_A = 25℃	I_D	±9	±6.2	A
T_A = 70℃		±7.4	±5.0	A
Pulsed Drain Current	I_{DM}	±30	±20	A
Continuous Source Current (Diode Conduction)8	I_S	1.7	-1.7	A
Maximum Power Dissipation* T_A = 25℃	P_D	2.5		W
T_A = 70℃		1.6		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}	38	50	40	50	℃/W
	Steady State		73	95	73	95	
Maximum Junction-to-Foot	Steady State	R_{thJc}	17	22	20	26	

*Surface Mounted on FR4 Board.

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■ Electrical Characteristics T_J = 25℃

Parameter	Symbol	Testconditons		Min	Typ	Max	Unit
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	N-Ch	0.8			V
		V_{DS} = V_{GS}, I_D = -250 μA	P-Ch	-0.45			
Gate Body Leakage	I_{GSS}	V_{DS} = 0 V V_{GS} = ±20 V	N-Ch			±100	nA
		V_{DS} = 0 V V_{GS} = ±8 V	P-Ch			±100	
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 24V, V_{GS} = 0 V	N-Ch			1	
		V_{DS} = -6.4V, V_{GS} = 0 V	P-Ch			-1	
		V_{DS} = 24 V, V_{GS} = 0 V, T_J = 55℃	N-Ch			5	μA
		V_{DS} = -6.4V, V_{GS} = 0 V, T_J = 55℃	P-Ch			-5	
On State Drain Currenta	$I_{D(on)}$	V_{DS} =5 V, V_{GS} = 10 V	N-Ch	30			A
		V_{DS} =-5 V, V_{GS} = -4.5 V	P-Ch	-20			
Drain Source On State Resistance*	$r_{DS(on)}$	V_{GS} = 10 V, I_D = 9A	N-Ch		0.015	0.018	Ω
		V_{GS} = -4.5 V, I_D = -6.2A	P-Ch		0.034	0.042	
		V_{GS} = 4.5 V, I_D = 7.4A	N-Ch		0.022	0.027	
		V_{GS} = -2.5 V, I_D = -5.2A	P-Ch		0.048	0.060	
Forward Transconductance*	g_{fs}	V_{DS} = 15 V, I_D = 9A	N-Ch		20		S
		V_{DS} = -15 V, I_D = -6.2A	P-Ch		14		
Diode Forward Voltage*	V_{SD}	I_S = 1.7A, V_{GS} = 0 V	N-Ch		0.71	1.1	V
		I_S = -1.7A, V_{GS} = 0 V	P-Ch		-0.70	-1.1	
Total Gate Charge	Q_g	N-Channel V_{DS} = 15 V, V_{GS} = 5V, I_D = 9A	N-Ch		4.5	20	pC
			P-Ch		15	25	
Gate Source Charge	Q_{gs}	P-Channel V_{DS} = -4 V, V_{GS} = -5 V, I_D = -6.2A	N-Ch		3.3		
			P-Ch		3.0		
Gate Drain Charge	Q_{gd}		N-Ch		6.6		
			P-Ch		2.0		
Turn On Time	$t_{d(on)}$	N Channel V_{DD} = 15 V, R_L = 15Ω I_D= 1A, V_{GEN} = 10V, R_g = 6 Ω	N-Ch		13	20	ns
			P-Ch		20	40	
Rise Time	t_r		N-Ch		9	18	
			P-Ch		50	100	
Turn Off Delay Time	$t_{d(off)}$	P-Channel V_{DD} = -4 V, R_L = 4Ω I_D= -1 A, V_{GEN} = -4.5 V, R_g = 6 Ω	N-Ch		35	50	
			P-Ch		110	220	
Fall Time	t_f		N-Ch		17	30	
			P-Ch		60	120	
Source-Drain Reverse Recovery Time	t_{rr}	I_F = 1.7 A, di/dt = 100 A/μs	N-Ch		35	70	
			P-Ch		60	100	

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