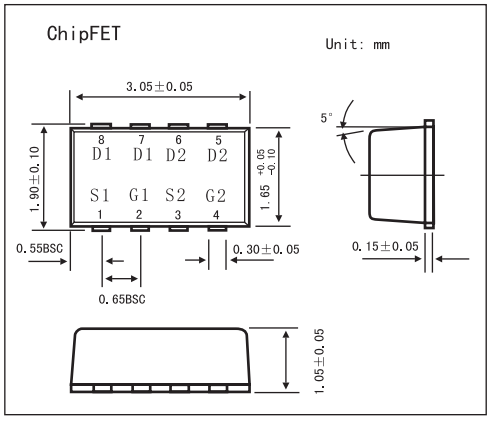
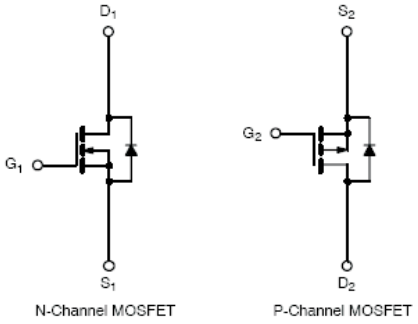
Complementary 20-V (D-S) MOSFET

KI5515DC



Features

- TrenchFET Power MOSFETS
- Ultra Low $r_{DS(on)}$ and Excellent Power Handling In Compact Footprint



Absolute Maximum Ratings T_A = 25℃

Parameter	Symbol	N-Channel		P-Channel		Unit
		5 secs	Steady State	5 secs	Steady State	
Drain-Source Voltage	V_{DS}	20		-20		V
Gate-Source Voltage	V_{GS}	±8				V
Continuous Drain Current (T_J = 150℃)* T_A = 25℃	I_D	5.9	4.4	-4.1	-3	A
T_A = 85℃		4.2	3.1	-2.9	-2.2	A
Pulsed Drain Current	I_{DM}	20		-15		A
Continuous Source Current (Diode Conduction)*	I_S	1.8	0.9	-1.8	-0.9	A
Maximum Power Dissipation* T_A = 25℃	P_D	2.1	1.1	2.1	1.1	W
T_A = 85℃		1.1	0.6	1.1	0.6	W
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to 150				℃

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

Thermal Resistance Ratings

Parameter		Symbol	Typ	Max	Unit
Maximum Junction-to-Ambient*	t ≤5 sec	R_{thJA}	50	60	℃/W
	Steady State		90	110	
Maximum Junction-to-Case (Drain)	Steady State	R_{thJF}	30	40	

*Surface Mounted on 1" X 1" 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	0.4		1.0	V
		V_{DS} = V_{GS}, I_D = -250 μA	P-Ch	-0.4		-1.0	
Gate Body Leakage	I_{GSS}	V_{DS} = 0 V V_{GS} = ±8 V	N-Ch			±100	nA
		V_{DS} = 0 V V_{GS} = ±8V	P-Ch			±100	
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 20V, V_{GS} = 0 V	N-Ch			1	
		V_{DS} = -20V, V_{GS} = 0 V	P-Ch			-1	
		V_{DS} = 20 V, V_{GS} = 0 V, T_J = 85℃	N-Ch			5	μA
		V_{DS} = -20V, V_{GS} = 0 V, T_J = 85℃	P-Ch			-5	
On State Drain Currenta	$I_{D(on)}$	V_{DS} ≥5 V, V_{GS} = 4.5 V	N-Ch	20			A
		V_{DS} ≤-5 V, V_{GS} = -4.5 V	P-Ch	-15			
Drain Source On State Resistance*	$r_{DS(on)}$	V_{GS} = 4.5 V, I_D = 4.4A	N-Ch		0.032	0.040	Ω
		V_{GS} = -4.5 V, I_D = -3.0A	P-Ch		0.069	0.086	
		V_{GS} = 2.5 V, I_D = 4.1A	N-Ch		0.036	0.045	
		V_{GS} = -2.5 V, I_D = -2.5A	P-Ch		0.097	0.121	
		V_{GS} = 1.8 V, I_D = 1.9A	N-Ch		0.042	0.052	
		V_{GS} = -1.8 V, I_D = -0.6A	P-Ch		0.137	0.171	
Forward Transconductance*	g_{fs}	V_{DS} = 10 V, I_D = 4.4A	N-Ch		22		S
		V_{DS} = -10 V, I_D = -3A	P-Ch		8		
Diode Forward Voltage*	V_{SD}	I_S = 0.9A, V_{GS} = 0 V	N-Ch		0.8	1.2	V
		I_S = -0.9A, V_{GS} = 0 V	P-Ch		-0.8	-1.2	
Total Gate Charge	Q_g	N-Channel	N-Ch		5	7.5	nC
		V_{DS} = 10V, V_{GS} = 4.5V, I_D = 4.4A	P-Ch		5.5	8.5	
Gate Source Charge	Q_{gs}		N-Ch		0.85		
		P-Channel	P-Ch		0.91		
Gate Drain Charge	Q_{gd}	V_{DS} = -10 V, V_{GS} = -4.5 V, I_D = -3A	N-Ch		1		
			P-Ch		1.6		
Turn On Time	$t_{d(on)}$	N Channel	N-Ch		20	30	ns
		V_{DD} = 10 V, R_L = 10Ω	P-Ch		18	30	
Rise Time	t_r	I_D= 1A, V_{GEN} = 4.5V, R_g = 6 Ω	N-Ch		36	55	
			P-Ch		32	50	
Turn Off Delay Time	$t_{d(off)}$	P-Channel	N-Ch		30	45	
		V_{DD} = -10 V, R_L = 10Ω	P-Ch		42	65	
Fall Time	t_f	I_D= -1 A, V_{GEN} = -4.5 V, R_g = 6 Ω	N-Ch		12	20	
			P-Ch		26	40	
Source-Drain Reverse Recovery Time	t_{rr}	I_F =0.9 A, di/dt = 100 A/μs	N-Ch		45	90	
		I_F = -0.9 A, di/dt = 100 A/μs	P-Ch		30	60	

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