Complementary 20-V (D-S) Low-Threshold MOSFET
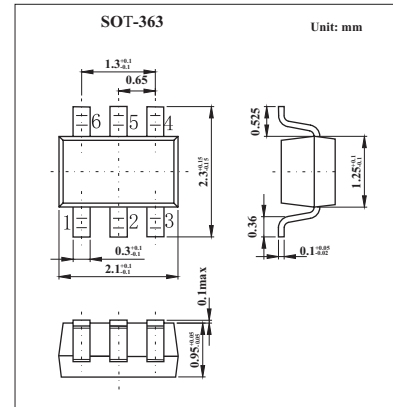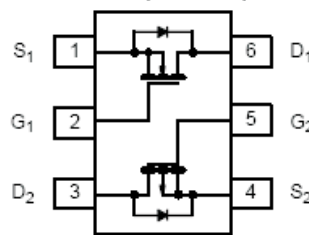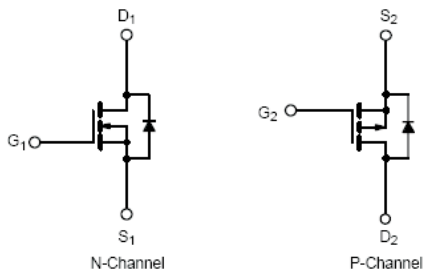
KI1563DH

■ Features

● TrenchFET Power MOSFETs

● Fast Switching

■ 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	1.28	1.13	-1	-0.88	A
$T_A = 85℃$		0.92	0.81	-0.72	-0.63	A
Pulsed Drain Current	I_{DM}	4		-3		A
Continuous Source Current (Diode Conduction)*	I_S	0.61	0.48	-0.61	-0.48	A
Maximum Power Dissipation* $T_A = 25℃$	P_D	0.74	0.57	0.3	0.57	W
$T_A = 85℃$		0.38	0.3	0.16	0.3	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 $T_A = 25℃$

Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient*	t ≤ 5 sec	R_{thJA}	130	170	℃/W
	Steady State		170	220	
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	80	100	

*Surface Mounted on 1" X1" 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 = 100 μA	N-Ch	0.45		1	V
		V_{DS} = V_{GS}, I_D = -100 μA	P-Ch	-0.45		1	
Gate Body Leakage	I_{GSS}	V_{DS} = 0 V V_{GS} =±8V	N-Ch			±100	nA
			P-Ch			±100	
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 16V, V_{GS} = 0 V	N-Ch			1	
		V_{DS} = -16V, V_{GS} = 0 V	P-Ch			-1	
		V_{DS} = 16 V, V_{GS} = 0 V, T_J = 85℃	N-Ch			5	μA
		V_{DS} = -16V, V_{GS} = 0 V, T_J = 85℃	P-Ch			-5	
On State Drain Current*	$I_{D(on)}$	V_{DS} ≥5 V, V_{GS} = 4.5 V	N-Ch	2			A
		V_{DS} ≤-5 V, V_{GS} = -4.5 V	P-Ch	-2			
Drain Source On State Resistance*	$r_{DS(on)}$	V_{GS} = 4.5 V, I_D = 1.13A	N-Ch		0.220	0.280	Ω
		V_{GS} = -4.5 V, I_D = -0.88A	P-Ch		0.400	0.490	
		V_{GS} = 2.5 V, I_D = 0.99A	N-Ch		0.281	0.360	
		V_{GS} = -2.5 V, I_D = -0.71A	P-Ch		0.610	0.750	
		V_{GS} = 1.8 V, I_D = 0.2A	N-Ch		0.344	0.450	
		V_{GS} = -1.8 V, I_D = -0.20A	P-Ch		0.850	1.10	
Forward Transconductance*	g_{fs}	V_{DS} = 10 V, I_D = 1.13A	N-Ch		2.6		mS
		V_{DS} = -10 V, I_D = -0.88A	P-Ch		1.5		
Diode Forward Voltage*	V_{SD}	I_S = 0.48A, V_{GS} = 0 V	N-Ch		0.8	1.2	V
		I_S = -0.48A, V_{GS} = 0 V	P-Ch		-0.8	-1.2	
Total Gate Charge	Q_g	N-Channel V_{DS} = 10 V, V_{GS} = 4.5V, I_D = 1.13A	N-Ch		1.25	2	pC
			P-Ch		1.2	1.8	
Gate Source Charge	Q_{gs}	P-Channel V_{DS} = -10 V, V_{GS} = -4.5 V, I_D = -0.88A	N-Ch		0.21		
			P-Ch		0.3		
Gate Drain Charge	Q_{gd}		N-Ch		0.3		
			P-Ch		0.21		
Turn On Time	$t_{d(on)}$	N Channel V_{DD} = 10 V, R_L = 20 Ω	N-Ch		15	25	ns
			P-Ch		18	30	
Rise Time	t_r	I_D= 0.5 A, V_{GEN} = 4.5V, R_g = 6 Ω	N-Ch		22	35	
			P-Ch		25	40	
Turn Off Delay Time	$t_{d(off)}$	P-Channel V_{DD} = -10 V, R_L = 20 Ω	N-Ch		25	40	
			P-Ch		15	25	
Fall Time	t_f	I_D= -0.5 A, V_{GEN} = -4.5 V, R_g = 6 Ω	N-Ch		12	20	
			P-Ch		12	20	
Source-Drain Reverse Recovery Time	t_{rr}	I_F = 0.48 A, d_i/d_t = 100 A/μs	N-Ch		30	60	
			P-Ch		30	60	

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