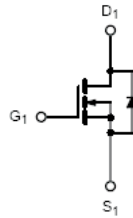


N- and P-Channel 12-V (D-S) MOSFET

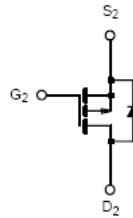
KI7540DP

■ Features

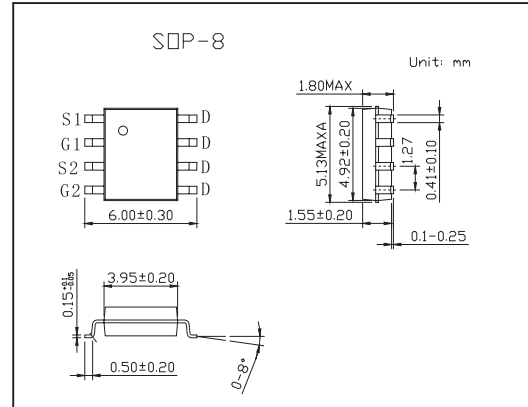
- TrenchFET Power MOSFET
- PWM Optimized for High Efficiency



N-Channel MOSFET



P-Channel MOSFET

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

Parameter	Symbol	N-Channel		P-Channel		Unit
		10 secs	Steady State	10 secs	Steady State	
Drain-Source Voltage	V_{DS}	12		-12		V
Gate-Source Voltage	V_{GS}	± 8		± 8		V
Continuous Drain Current ($T_J = 150^\circ\text{C}$)* $T_A = 25^\circ\text{C}$	I_D	11.8	7.6	-8.9	-5.7	A
		$T_A = 70^\circ\text{C}$		9.5	6.1	-7.1
Pulsed Drain Current	I_{DM}	20				A
Continuous Source Current (Diode Conduction)*	I_S	2.9	1.1	-2.9	-1.1	A
Maximum Power Dissipation*	P_D	$T_A = 25^\circ\text{C}$		3.5	1.4	W
		$T_A = 70^\circ\text{C}$		2.2	0.9	W
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to 150				$^\circ\text{C}$

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

■ Thermal Resistance Ratings

Parameter	Symbol	N-Channel		P-Channel		Unit	
		Typ	Max	Typ	Max		
Maximum Junction-to-Ambient*	R_{thJA}	$t \leq 10 \text{ sec}$	26	35	26	35	$^\circ\text{C/W}$
		Steady State	60	85	60	85	
Maximum Junction-to-Case (Drain)	R_{thJC}	3.9	5.5	3.9	5.5		

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

KI7540DP

■ Electrical Characteristics T_J = 25°C

Parameter	Symbol	Testconditons	Min	Typ	Max	Unit	
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	N-Ch	0.6		1.5	V
		V _{DS} = V _{GS} , I _D = -250 μA	P-Ch	-0.6		-1.5	
Gate Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±8 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} = 9.6V, V _{GS} = 0 V	N-Ch			1	nA
		V _{DS} = -9.6V, V _{GS} = 0 V	P-Ch			-1	
		V _{DS} = 20 V, V _{GS} = 0 V, T _J = 55°C	N-Ch			5	μA
		V _{DS} = -20V, V _{GS} = 0 V, T _J = 55°C	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	-20			
Drain Source On State Resistance*	r _{DS(on)}	V _{GS} = 4.5 V, I _D = 11.8A	N-Ch		0.014	0.017	Ω
		V _{GS} = -4.5 V, I _D = -8.9A	P-Ch		0.026	0.032	
		V _{GS} = 2.5 V, I _D = 9.8A	N-Ch		0.020	0.025	
		V _{GS} = -2.5 V, I _D = -6.9A	P-Ch		0.043	0.053	
Forward Transconductance*	g _{fs}	V _{DS} = 5 V, I _D = 11.8A	N-Ch		32		S
		V _{DS} = -5 V, I _D = -8.9A	P-Ch		23		
Diode Forward Voltage*	V _{SD}	I _S = 2.9A, V _{GS} = 0 V	N-Ch		0.77	1.2	V
		I _S = -2.9A, V _{GS} = 0 V	P-Ch		-0.8	-1.2	
Total Gate Charge	Q _g	N-Channel V _{DS} = 6 V, V _{GS} = 4.5V, I _D = 11.8A	N-Ch		11.5	17	nC
Gate Source Charge	Q _{gs}	P-Channel	N-Ch		3.2		
			P-Ch		4.1		
Gate Drain Charge	Q _{gd}	V _{DS} = -6 V, V _{GS} = -4.5 V, I _D = -8.9A	N-Ch		2.5		
			P-Ch		1.9		
Gate Resistance	R _G		N-Ch		1.7		Ω
			P-Ch		3.5		
Turn On Time	t _{d(on)}	N Channel V _{DD} = 6 V, R _L = 6 Ω	N-Ch		30	45	ns
Rise Time	t _r	I _D = 1A, V _{GEN} = 4.5V, R _g = 6 Ω	P-Ch		35	55	
			N-Ch		50	75	
Turn Off Delay Time	t _{d(off)}	P-Channel V _{DD} = -6 V, R _L = 6 Ω	N-Ch		60	90	
			P-Ch		54	85	
Fall Time	t _f	I _D = -1 A, V _{GEN} = -4.5 V, R _g = 6 Ω	N-Ch		25	40	
			P-Ch		17	30	
Source-Drain Reverse Recovery Time	t _{rr}	I _F = 2.9 A, di/dt = 100 A/μs	N-Ch		40	80	
		I _F = -2.9 A, di/dt = 100 A/μs	P-Ch		40	80	

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