

High-side Power Switch ICs [With Diagnostic Function, Surface-mount 2-circuits] **SPF5004**

Features

- Built-in diagnostic function to detect short and open circuiting of loads and output status signals
- DMOS 2ch output
- Allows ON/OFF using C-MOS logic level
- Built-in overcurrent and thermal protection circuits

Absolute Maximum Ratings

(Ta=25°C)

Parameter	Symbol	Ratings	Unit	Conditions
Power supply voltage	V _B	35	V	
Input terminal voltage	V _{IN}	-0.3 to 7	V	
Input terminal current	I _{IN}	5	mA	
DG terminal voltage	V _{DG}	-0.3 to 7	V	
DG terminal current	I _{DG}	5	mA	
Drain to source voltage	V _{DS}	V _B -45	V	
Output current	I _O	2.5	A	
Power dissipation	P _D	2.7	W	Ta=25°C
Source to drain Di forward current	I _F	0.8	A	
Channel temperature	T _{ch}	150	°C	
Operating temperature	T _{OP}	-40 to +105	°C	
Storage temperature	T _{stg}	-40 to +150	°C	

Electrical Characteristics

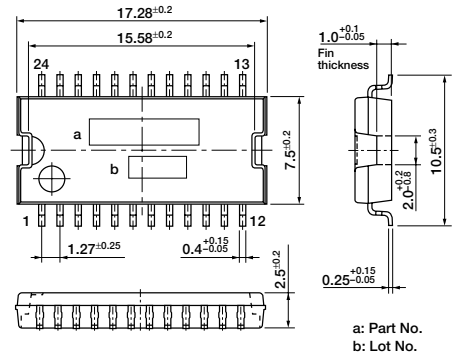
(V_B=14V, Ta=25°C unless otherwise specified)

Parameter	Symbol	Ratings			Unit	Conditions
		min	typ	max		
Operating power supply voltage	V _{B (opr)}	5.5		35	V	
Quiescent circuit current	I _q			1	mA	V _{IN} =0V, V _{OUT} =0V
Output ON resistance	R _{DS (ON)}		150	mΩ		I _O =2A
			250	mΩ		I _O =1A, Ta=80°C
Output leak current	I _{O, leak}		50	μA		V _{OUT} =0V
Input voltage	Output ON	V _{IH}	2.0	3.0	V	Ta= -40 to +105°C
	Output OFF	V _{IL}	1.0	1.8	V	Ta= -40 to +105°C
Input current	Output ON	I _{IH}	70	μA		V _{IN} =5V
Overcurrent protection starting current	I _S	2.6			A	V _{OUT} =V _O -1.5V
Internal current limit	I _{Lim}		10		A	V _{OUT} =0V
Thermal shutdown operating temperature	T _{TSD}	155	165		°C	
Load open detection threshold voltage	V _{open}		3		V	
Output transfer time	T _{ON}		165		μs	
	T _{OFF}		60		μs	
DG leak current	I _{DG}			20	μA	V _{DG} =5.5V
Low level DG output voltage	V _{DGL}		0.15		V	I _{DG} =1.6mA
DG output transfer time	T _{PLH}		70		μs	
	T _{PHL}		45		μs	

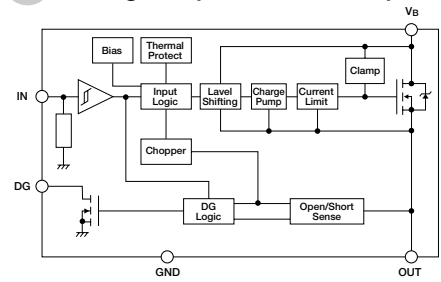
Recommended Operating Conditions (for one channel)

Parameter	Ratings		Unit
	min	max	
Power supply voltage	5.5	16	V
V _{IH}	4	5.5	V
V _{IL}	-0.3	0.9	V
I _O		1.15	A
R _{IN}	10	20	kΩ
R _{OG}	10	20	kΩ

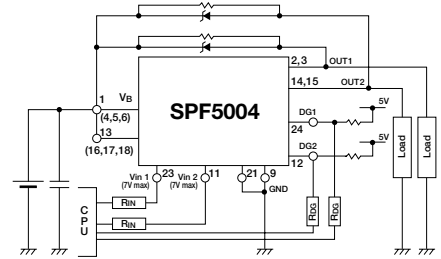
External Dimensions (unit: mm)



Block Diagram (for one channel)

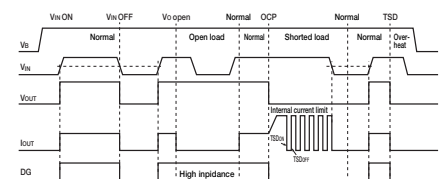


Standard Connection Diagram



* Make V_B of 4Pin, 5Pin, 6Pin, 16Pin, 17Pin and 18Pin short from the fin to be plated by solder.

Timing Chart



Mode	V _{IN}	DG	V _O
Normal	H	H	H
Open load	H	H	H
Shorted load	H	L	L (Limiting)
Overheat	H	L	L