

Features

- Built-in diagnostic function to detect short and open circuiting of loads and output status signals
- DMOS 3ch 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	1.8	A	
Power dissipation	P_D	2.7	W	$T_a=25^{\circ}\text{C}$, all circuit operating
Source to drain D_i forward current	I_F	0.8	A	
Channel temperature	T_{ch}	150	$^{\circ}\text{C}$	
Operating temperature	T_{OP}	-40 to +105	$^{\circ}\text{C}$	
Storage temperature	T_{stg}	-40 to +150	$^{\circ}\text{C}$	

Electrical Characteristics

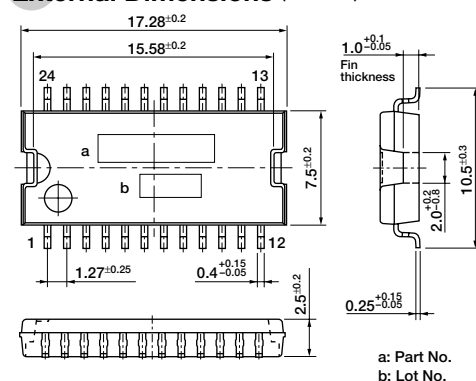
($V_B=14V$, $T_a=25^{\circ}C$ unless otherwise specified)

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		$R_{DS(ON)}$			200	m Ω	$I_O=1A$
					350	m Ω	$I_O=1A$, $T_a=80^{\circ}C$
Output leak current		I_O , leak		50	100	μA	$V_{OUT}=0V$
Input threshold voltage	Output ON	V_{IHth}	1.4	2.0	3.0	V	$T_a=-40$ to $+105^{\circ}C$
	Output OFF	V_{ILth}	1.0	1.8		V	$T_a=-40$ to $+105^{\circ}C$
Input current	Output ON	I_{IH}		70	200	μA	$V_{IN}=5V$
	Output OFF	I_{IL}			12	μA	$V_{IN}=0V$
Overcurrent protection starting current		I_S	1.9	3		A	$V_{OUT}=V_O-1.5V$
Internal current limit		I_{Lim}		5		A	$V_{OUT}=0V$
Thermal shutdown operating temperature		T_{TSD}	155	165		$^{\circ}C$	
Load open detection threshold voltage		V_{open}	1.5	3	4.5	V	
Output transfer time		T_{ON}		70	140	μs	$R_L=14\Omega$, $V_{OUT}=V_B-5V$
		T_{OFF}		35	90	μs	$R_L=14\Omega$, $V_B \cdot 10\%$
DG leak current		I_{DG}			20	μA	$V_{DG}=5.5V$
Low level DG output voltage		V_{DGL}		0.15	0.5	V	$I_{DG}=1.6mA$
DG output transfer time		T_{PLH}		70	140	μs	
		T_{PHL}		45	120	μs	

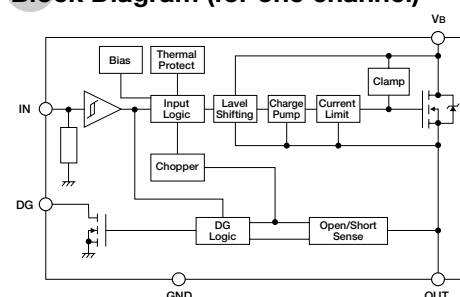
Recommended Operating Conditions (for one channel)

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	A
R _{IN}	10	20	kΩ
R _{DS}	10	20	kΩ

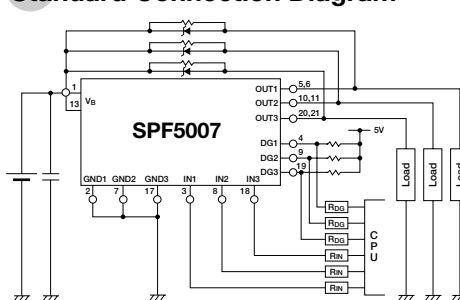
External Dimensions (unit: mm)



Block Diagram (for one channel)

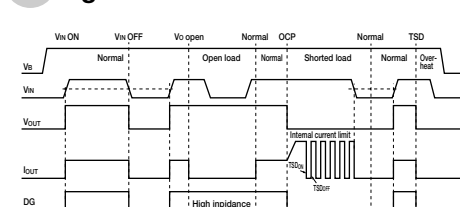


Standard Connection Diagram



- * R1N and R1DG are needed to protect CPU and SPF5007 in case of reverse connection of V_B terminal.
- * Make V_B of 1Pin and 13Pin short from the fin to be plated by solder.

Timing Chart



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