

Low-side Switch ICs [Surface-mount 4-circuits] **SPF5002A**

Features

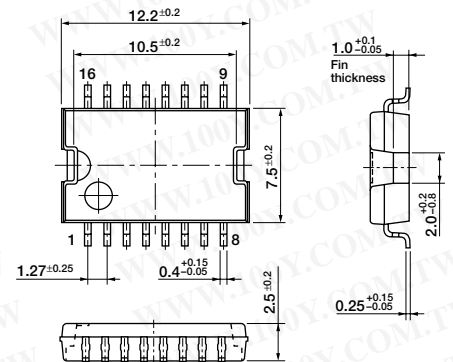
- DMOS 4ch output
- Allows ON/OFF using C-MOS logic level
- Built-in overcurrent, overvoltage and thermal protection circuits

Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit	Conditions
Power supply voltage	V_B	40	V	
Output terminal voltage	V_{OUT}	37	V	*
Input terminal voltage	V_{IN}	-0.5 to +7.5	V	
Output current	I_O	1.8	A	
Power Dissipation	P_D	2	W	
Storage temperature	T_{stg}	-40 to +150	°C	
Channel temperature	T_{ch}	150	°C	
Output avalanche capability	E_{AV}	50	mJ	Single pulse

Note: * At the clamping operation, refer to V_{OUT} (clamp) in the section of electrical characteristics.

External Dimensions (unit: mm)



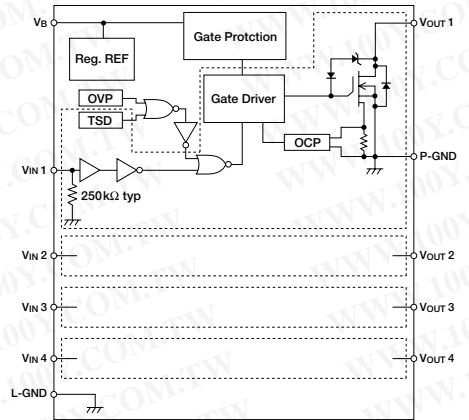
Electrical Characteristics

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

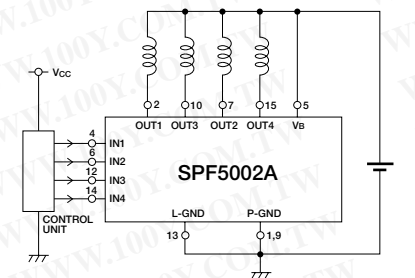
Parameter	Symbol	Ratings			Unit	Conditions
		min	typ	max		
Power supply voltage	V_{Bopr}	5.5		25	V	
Quiescent circuit current	I_q		5	7	mA	$V_{IN}=0V$ (all inputs)
Operating circuit current	I_{cc}		8	12	mA	$V_{IN}=5V$ (all inputs)
Input voltage	Hi output V_{IN}	3.5		5.5	V	$I_O=1A$
	Lo output V_{IN}	-0.5		1.5	V	
Input current	Hi output I_{IN}			50	μA	$V_{IN}=5V$
	Lo output I_{IN}			30	μA	$V_{IN}=0V$
Output ON resistance	$R_{DS(ON)}$		0.4	0.6	Ω	$V_B=5.5V$
			0.5	0.7	Ω	
Output clamp voltage	$V_{OUT(clamp)}$	41	50	55	V	$I_O=1A$
Output leak current	I_{OH}			10	μA	$V_O=37V$
Forward voltage of output stage diode	V_F			1.6	V	$I_F=0.5A$
Overvoltage protection starting voltage	$V_B(ovp)$	25		40	V	
Thermal protection starting temperature	T_{TSD}	151	165		°C	
Overcurrent protection starting current	I_S	1.1			A	
Output transfer time	T_{ON}			12	μs	$R_L=14\Omega$, $I_O=1A$
	T_{OFF}			8	μs	$R_L=14\Omega$, $I_O=1A$
Output rise time	T_r			5	μs	$R_L=14\Omega$, $I_O=1A$
Output fall time	T_f			10	μs	$R_L=14\Omega$, $I_O=1A$

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Equivalent Circuit Diagram



Circuit Example

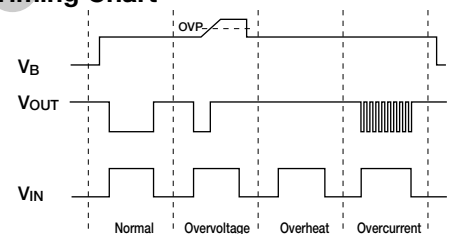


Truth table

V_{IN}	V_O
H	L
L	H

Use L-GND and P-GND being connected.

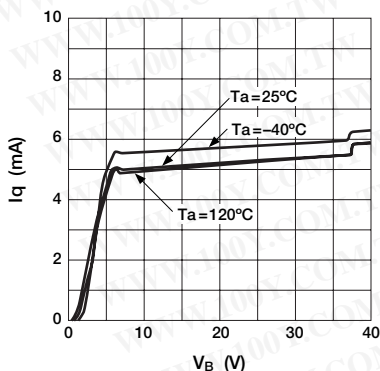
Timing Chart



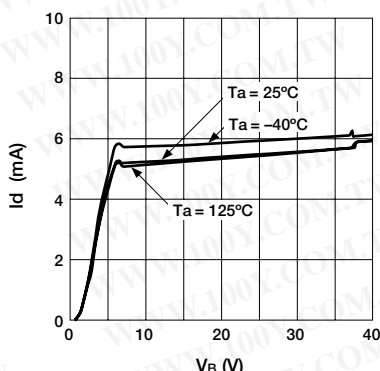
* Self-excited frequency is used in the overcurrent protection.

Electrical Characteristics

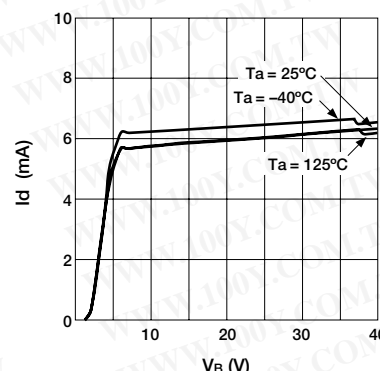
■ Quiescent Circuit Current



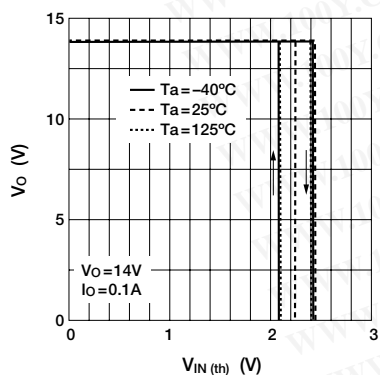
■ Circuit Current (single circuit)



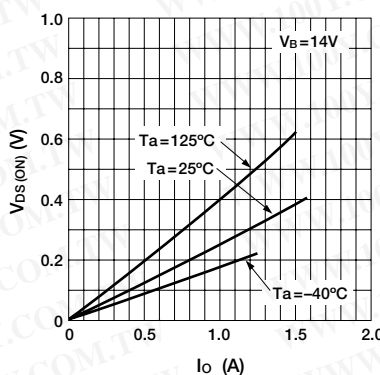
■ Circuit Current (4 circuits)



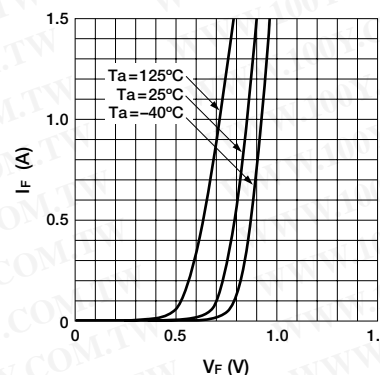
■ Threshold Input Voltage



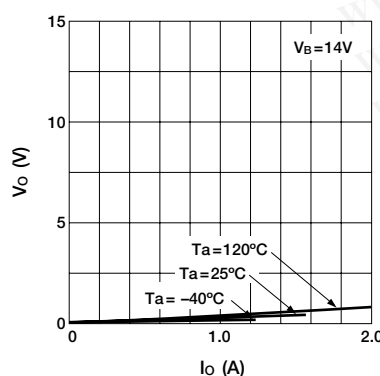
■ Output ON Voltage



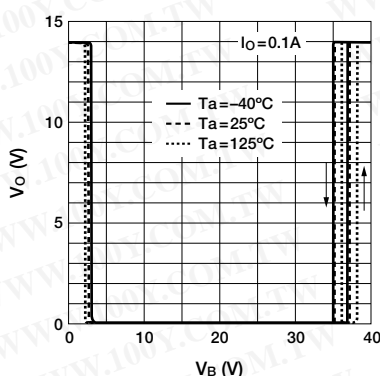
■ Forward Voltage of Output Stage Diode



■ Overcurrent Protection Characteristics



■ Overvoltage Protection Starting Voltage



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