

CPH5871

Power MOSFET 30V, 52mΩ, 3.5A, Single N-Channel with Schottky Diode



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Features

- Composite Type with a N-channel Silicon MOSFET and a Schottky Barrier Diode Contained in One Package Facilitating High-density Mounting
 - ESD Diode-Protected Gate
 - Pb-Free, Halogen Free and RoHS Compliance
- [MOSFET] • High Speed Switching
- 1.8V Drive
- [SBD] • Short Reverse Recovery Time
- Low Forward Voltage

Specifications

Absolute Maximum Ratings at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Value	Unit
[MOSFET]			
Drain to Source Voltage	V_{DS}	30	V
Gate to Source Voltage	V_{GS}	± 12	V
Drain Current (DC)	I_D	3.5	A
Drain Current (Pulse) $PW \leq 10\mu\text{s}$, duty cycle $\leq 1\%$	I_{DP}	14	A
Power Dissipation When mounted on ceramic substrate (600mm ² × 0.8mm) 1unit	P_D	0.9	W
Junction Temperature	T_J	150	°C
Storage Temperature	T_{stg}	-55 to +125	°C
[SBD]			
Repetitive Peak Reverse Voltage	V_{RRM}	30	V
Nonrepetitive Peak Reverse Surge Voltage	V_{RSM}	35	V
Average Output Current	I_O	1	A
Surge Forward Current 50Hz sine wave, 1cycle	I_{FSM}	10	A
Junction Temperature	T_J	-55 to +125	°C
Storage Temperature	T_{stg}	-55 to +125	°C

Thermal Resistance Ratings

Parameter	Symbol	Value	Unit
Junction to Ambient When mounted on ceramic substrate (600mm ² × 0.8mm) 1unit	$R_{\theta JA}$	138.8	°C/W

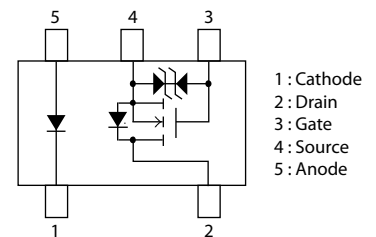
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

ORDERING INFORMATION

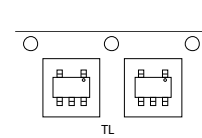
See detailed ordering and shipping information on page 6 of this data sheet.

V_{DS}	$R_{DS(on)}$ Max	I_D Max
[MOSFET] 30V	52mΩ@ 4.5V	3.5A
	74mΩ@ 2.5V	
	132mΩ@ 1.8V	

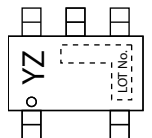
Electrical Connection N-Channel



Packing Type : TL



Marking



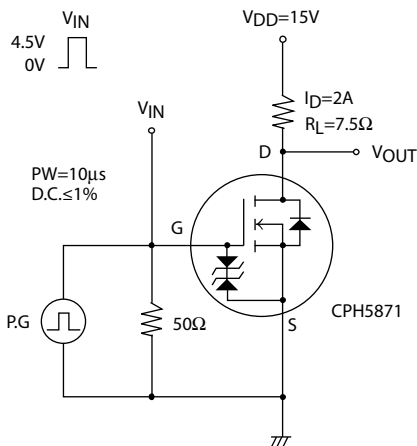
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Electrical Characteristics at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Value			Unit
			min	typ	max	
[MOSFET]						
Drain to Source Breakdown Voltage	V(BR)DSS	ID=1mA, VGS=0V	30			V
Zero-Gate Voltage Drain Current	IDSS	VDS=30V, VGS=0V			1	μA
Gate to Source Leakage Current	IGSS	VGS=±8V, VDS=0V			±10	μA
Gate Threshold Voltage	VGS(th)	VDS=10V, ID=1mA	0.4		1.3	V
Forward Transconductance	gFS	VDS=10V, ID=2A	2.0	3.4		S
Static Drain to Source On-State Resistance	RDS(on)1	ID=2A, VGS=4.5V		40	52	mΩ
	RDS(on)2	ID=1A, VGS=2.5V		53	74	mΩ
	RDS(on)3	ID=0.5A, VGS=1.8V		82	132	mΩ
Input Capacitance	Ciss	VDS=10V, f=1MHz		430		pF
Output Capacitance	Coss			59		pF
Reverse Transfer Capacitance	Crss			38		pF
Turn-ON Delay Time	tD(on)	See specified Test Circuit		10		ns
Rise Time	tr			41		ns
Turn-OFF Delay Time	tD(off)			36		ns
Fall Time	tf			37		ns
Total Gate Charge	Qg	VDS=15V, VGS=4.5V, ID=3.5A		4.7		nC
Gate to Source Charge	Qgs			0.8		nC
Gate to Drain "Miller" Charge	Qgd			1.1		nC
Forward Diode Voltage	VSD	IS=3.5A, VGS=0V		0.8	1.2	V
[SBD]						
Reverse Voltage	VR	IR=0.5mA	30			V
Forward Voltage	VF1	IF=0.7A		0.45	0.5	V
	VF2	IF=1A		0.48	0.53	V
Reverse Current	IR	VR=16V			15	μA
Interterminal Capacitance	C	VR=10V, f=1MHz, 1cycle		27		pF
Reverse Recovery Time	trr	IF= IR=100mA, See specified Test Circuit			10	ns

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

Switching Time Test Circuit (MOSFET)



t_{rr} Test Circuit (SBD)

