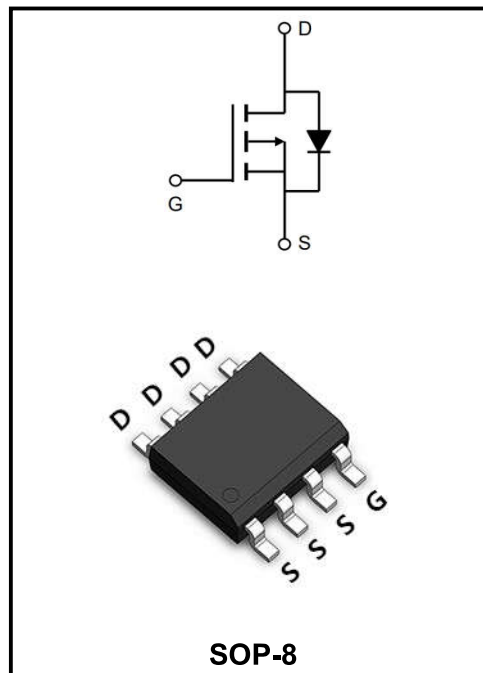


-20V P-Channel Enhancement Mode MOSFET

MAIN CHARACTERISTICS

I_D	-16A
V_{DS}	-20V
R_{DS(on)}-typ(@V_{GS}=-4.5V)	< 15mΩ (Typ:12mΩ)
R_{DS(on)}-typ(@V_{GS}=-2.5V)	< 20mΩ (Typ:16mΩ)



DESCRIPTION

The YFW16P02S uses advanced trench technology to provide excellent R_{ps(on)}, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.

APPLICATION

- ◆ Battery protection
- ◆ Load switch
- ◆ Uninterruptible power supply

Absolute Maximum Ratings (T_c=25°C unless otherwise noted)

Parameter	Symbol	Value	Units
Drain-Source Voltage	V _{DS}	-20	V
Gate-Source Voltage	V _{GS}	±12	V
Continuous Drain Current, V _{GS} @ -4.5V ¹ @T _c =25°C	I _D	-16	A
Continuous Drain Current, V _{GS} @ -4.5V ¹ @T _c =70°C	I _D	-15	A
Pulsed Drain Current ²	I _{DM}	-45	A
Total Power Dissipation ³ @T _c =25°C	P _D	10	W
Total Power Dissipation ³ @T _c =70°C	P _D	8.5	W
Storage Temperature Range	T _{STG}	-55 to 150	°C
Operating Junction Temperature Range	T _J	-55 to 150	°C
Thermal Resistance Junction-Ambient ¹	R _{θJA}	85	°C/W
Thermal Resistance Junction-Case ¹	R _{θJC}	12	°C/W

Electrical Characteristics (T_J=25°C, unless otherwise noted)

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250uA	BV_{DSS}	-20	-24	-	V
BV _{DSS} Temperature Coefficient	Reference to 25°C, I _D =-1mA	$\Delta BV_{DSS}/\Delta T_J$	-	-0.012	-	V/°C
Static Drain-Source On-Resistance ²	V _{GS} =-4.5V, I _D =-10A	R_{DS(on)}	-	12	15	mΩ
Static Drain-Source On-Resistance ²	V _{GS} =-2.5V, I _D =-5A	R_{DS(on)}	-	16	20	
Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =-250uA	V_{GS(th)}	-0.5	-0.7	-1.2	V
V _{GS(th)} Temperature Coefficient		$\Delta V_{GS(th)}$	-	2.94	-	mV/°C
Drain-Source Leakage Current	V _{DS} =-20V, V _{GS} =0V, T _J =25°C	I_{DSS}	-	---	1	uA
Gate-Source Leakage Current	V _{GS} =±12V, V _{DS} =0V	I_{GSS}	-	---	±100	nA
Total Gate Charge (-4.5V)	V _{DS} =-10V V _{GS} =-4.5V I _D =-6A	Q_G	-	15.3	-	nC
Gate-Source Charge		Q_{GS}	-	2.2	-	
Gate-Drain Charge		Q_{GD}	-	4.4	-	
Turn-On Delay Time	V _{DD} =-10V V _{GS} =-4.5V R _G =3.3Ω I _D =-10A	t_{d(ON)}	-	10	-	ns
Rise Time		t_r	-	31	-	
Turn-Off Delay Time		t_{d(OFF)}	-	28	-	
Fall Time		t_f	-	8	-	
Input Capacitance	V _{DS} =-10V V _{GS} =0V f=1MHz	C_{iss}	-	2000	-	pF
Output Capacitance		C_{oss}	-	242	-	
Reverse Transfer Capacitance		C_{rss}	-	231	-	
Continuous Source Current ^{1,4}	V _G =V _D =0V, Force Current	I_S	-	-	-12	A
Pulsed Source Current ^{2,4}		I_{SM}	-	-	-48	A
Diode Forward Voltage ²	V _{GS} =0V, I _S =-1A, T _J =25°C	V_{SD}	-	-	-1.2	V

Note :

- 1、The data tested by surface mounted on a 1 inch 2 FR-4 board with 20Z copper.
- 2、The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
- 3、The power dissipation is limited by 150°C junction temperature
- 4、The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

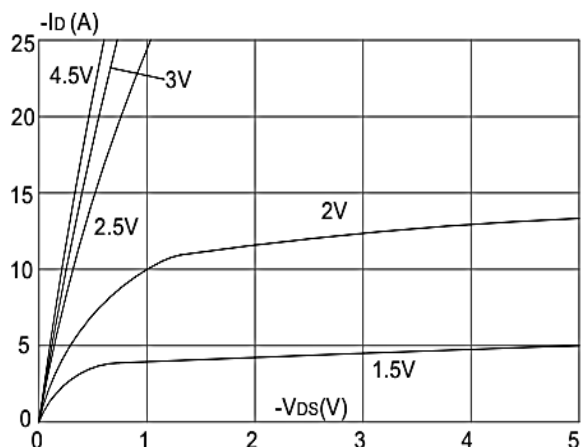


Figure1: Output Characteristics

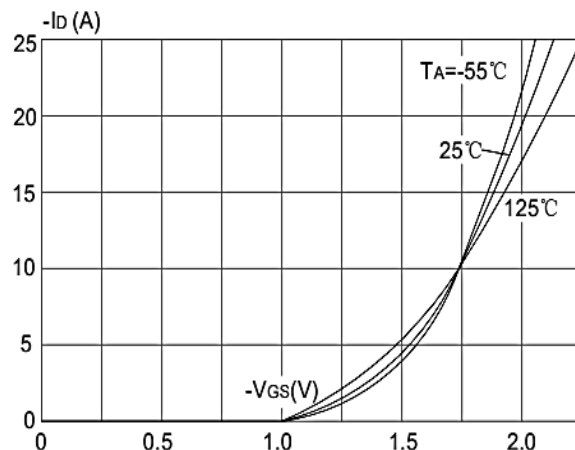


Figure 2: Typical Transfer Characteristics

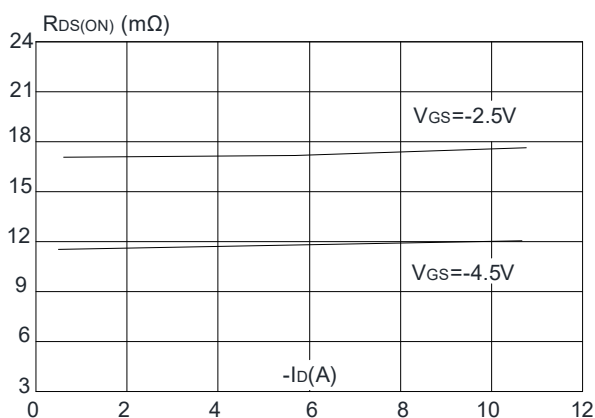


Figure 3: On-resistance vs. Drain Current

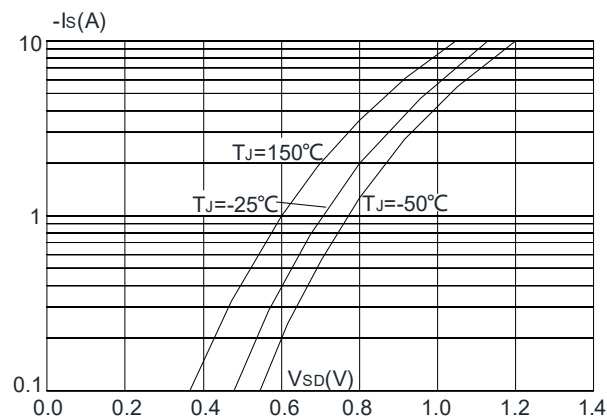


Figure 4: Body Diode Characteristics

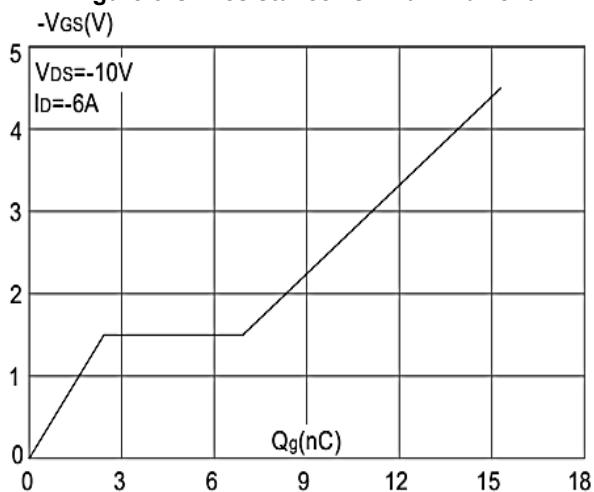


Figure 5: Gate Charge Characteristics

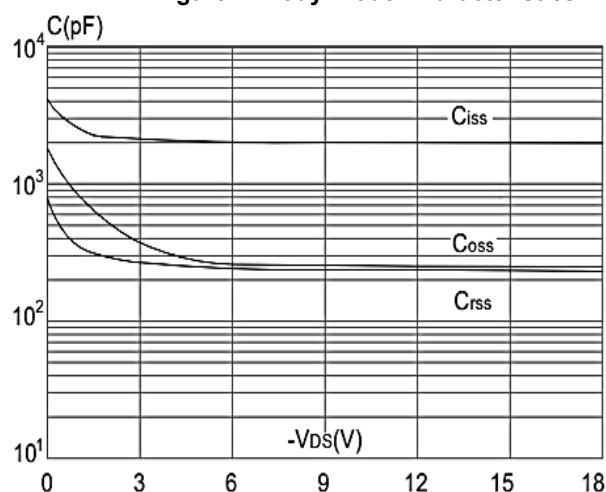


Figure 6: Capacitance Characteristics

Typical Characteristics

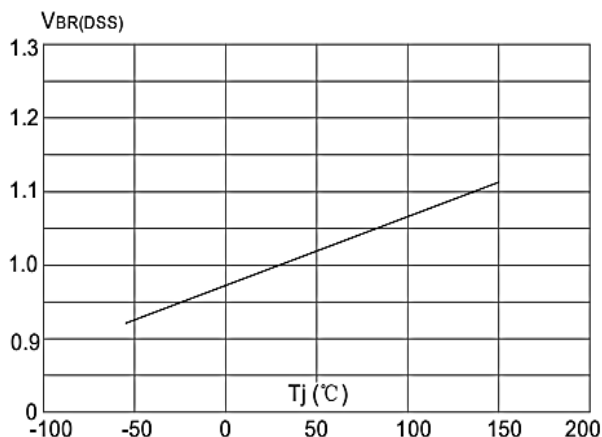


Figure 7: Normalized Breakdown Voltage vs Junction Temperature

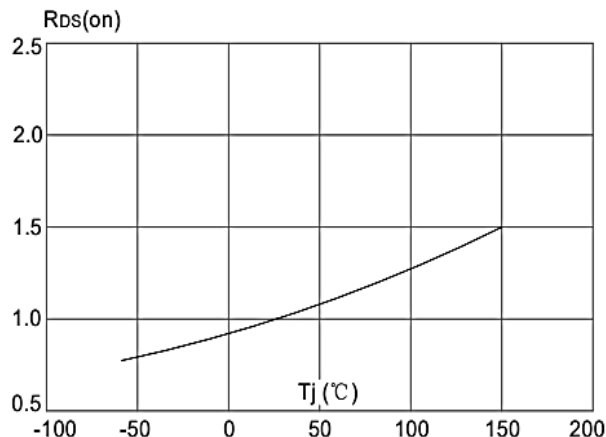


Figure 8: Normalized on Resistance vs. Junction Temperature

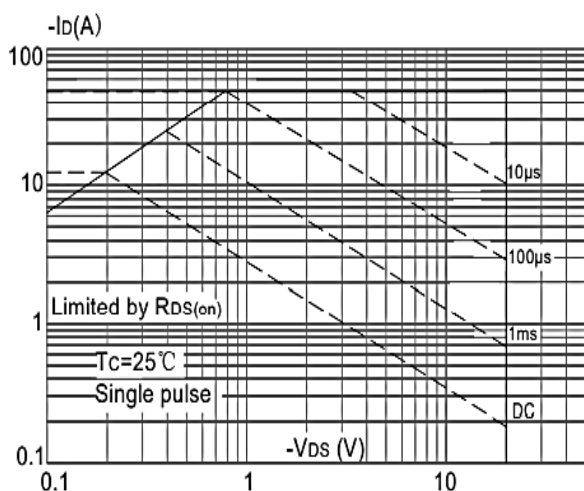


Figure 9: Maximum Safe Operating Area

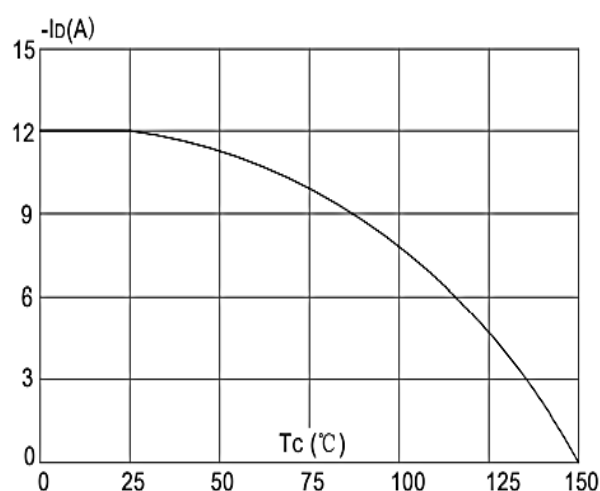


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

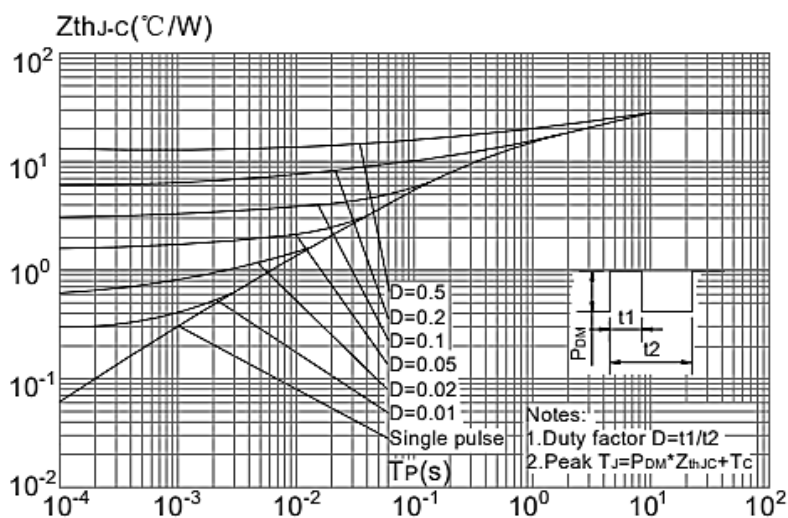
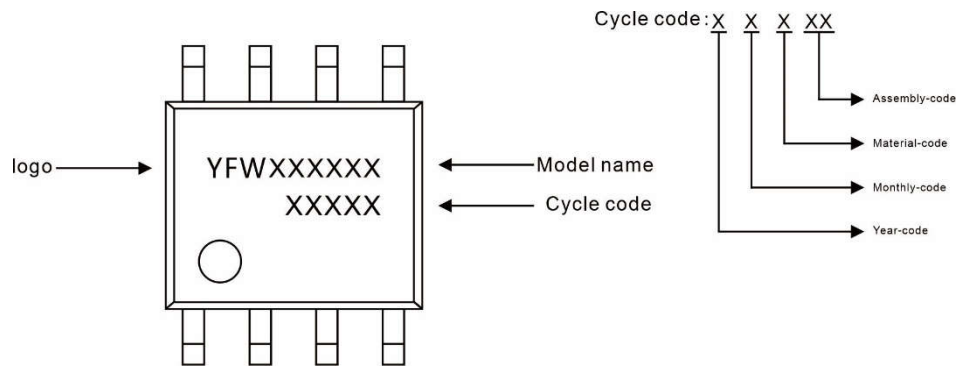


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambien

Marking Diagram



Ordering information

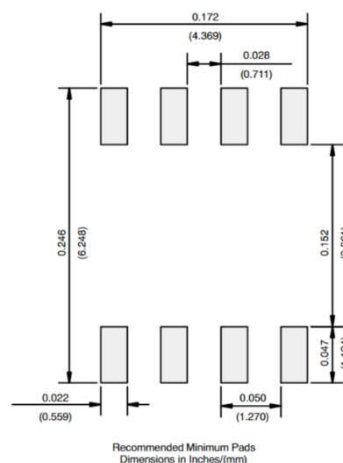
Package	Packing Description	Packing Quantity
SOP-8	Tape/Reel, 13" reel	3000PCS/Reel 30000PCS/Carton

Package Dimensions

SOP-8

Dim	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	1.35	1.75	0.053	0.069
A1	0.10	0.25	0.004	0.010
A2	1.35	1.50	0.053	0.059
b	0.35	0.55	0.014	0.022
c	0.15	0.25	0.006	0.010
D	4.80	5.00	0.189	0.197
D1	3.10	3.50	0.122	0.138
E	5.80	6.20	0.228	0.244
E1	3.80	4.00	0.150	0.157
E2	2.20	2.60	0.087	0.102
e	1.27 (BSC)		0.050 (BSC)	
L	0.40	1.27	0.016	0.050
θ	0°	8°	0°	8°

The recommended mounting pad size



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