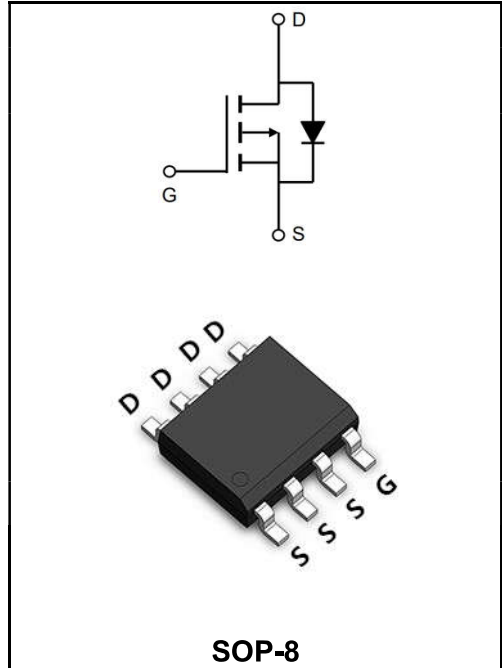


**-20V P-CHANNEL ENHANCEMENT MODE MOSFET**

**MAIN CHARACTERISTICS**

<b>I<sub>D</sub></b>	-16A
<b>V<sub>DSS</sub></b>	-20V
<b>R<sub>DS(on)-typ</sub>(@V<sub>GS</sub>=-4.5V)</b>	< 20mΩ ( <b>Type:14 mΩ</b> )



**Application**

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

**Product Specification Classification**

Part Number	Package	Marking	Pack
YFW16P02S	SOP-8	YFW 16P02S XXXXX	3000PCS/Tape

**Maximum Ratings at T<sub>c</sub>=25°C unless otherwise specified**

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V <sub>DS</sub>	-20	V
Gate - Source Voltage	V <sub>GS</sub>	±12	V
Continuous Drain Current, V <sub>GS</sub> @ -4.5V <sup>1</sup> @T <sub>C</sub> =25°C	I <sub>D</sub>	-16	A
Continuous Drain Current, V <sub>GS</sub> @ -4.5V <sup>1</sup> @T <sub>C</sub> =70°C	I <sub>D</sub>	-8	A
Pulsed Drain Current <sup>2</sup>	I <sub>DM</sub>	-48	A
Total Power Dissipation <sup>3</sup> @T <sub>C</sub> =25°C	P <sub>D</sub>	2.5	W
Total Power Dissipation <sup>3</sup> @T <sub>C</sub> =70°C	P <sub>D</sub>	1.6	W
Storage Temperature Range	T <sub>STG</sub>	-55 to +150	°C
Operating Junction Temperature Range	T <sub>J</sub>	-55 to +150	°C
Thermal Resistance Junction-Ambient <sup>1</sup>	R <sub>θJA</sub>	85	°C/W
Thermal Resistance Junction to Case <sup>1</sup>	R <sub>θJC</sub>	24	°C/W

**Maximum Ratings at Tc=25°C unless otherwise specified**

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	$BV_{DSS}$	-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 <sup>2</sup>	$V_{GS}=-4.5V, I_D=-20A$	$R_{DS(ON)}$	-	14	20	mΩ
	$V_{GS}=-2.5V, I_D=-10A$		-	22	28	
Gate -Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	$V_{GS(th)}$	-0.5	-0.6	-1.2	V
$V_{GS(th)}$ Temperature Coefficient		$\Delta V_{GS(th)}$	-	2.94	-	mV/°C
Drain-Source Leakage Current	$V_{DS}=-20V, V_{GS}=0V, T_J=25^\circ C$	$I_{DSS}$	-	-	1	μA
Gate -Source Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$	$I_{GSS}$	-	-	±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	$V_{DD}=-10V$ $V_{GS}=-4.5V$ $I_D=-10A$ $R_G=3.3\Omega$	$t_{d(on)}$	-	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 <sup>1,4</sup>	$V_G=V_D=0V, \text{ Force Current}$	$I_S$	-	-	-20	A
Pulsed Source Current <sup>2,4</sup>		$I_{SM}$	-	-	-48	A
Diode Forward Voltage <sup>2</sup>	$V_{GS}=0V, I_S=-1A, T_J=25^\circ C$	$V_{SD}$	-	-	-1.2	V

Note :

- 1、 The data tested by surface mounted on a 1 inch 2 FR-4 board with 2OZ copper.
- 2、 The data tested by pulsed , pulse width  $\cong 300\mu s$  , duty cycle  $\cong 2\%$
- 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.

Ratings and Characteristic Curves

Typical Characteristics

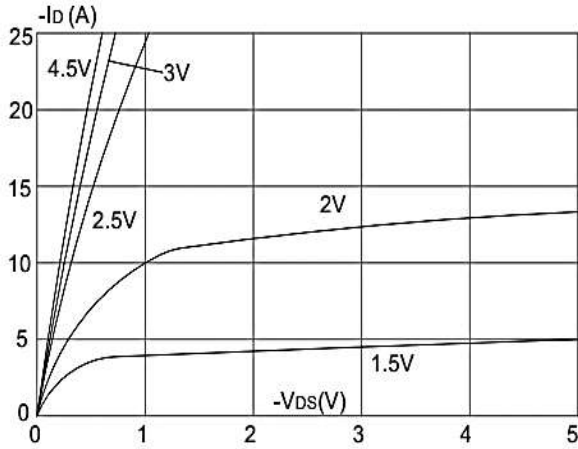


Figure 1: Output Characteristics

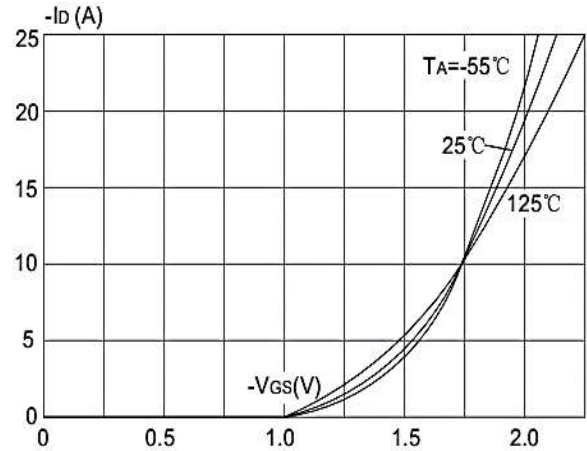


Figure 2: Typical Transfer Characteristics

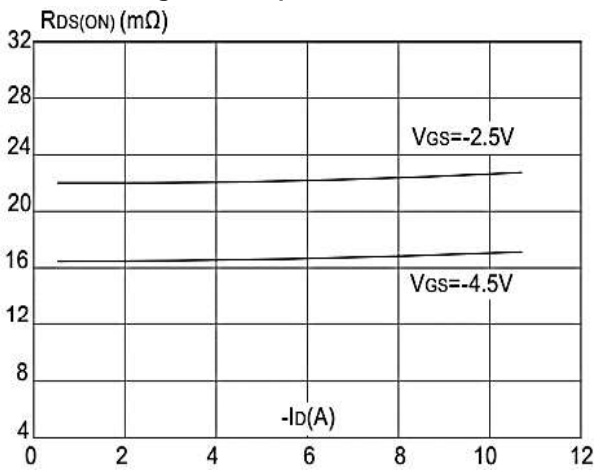


Figure 3: On-resistance vs. Drain Current

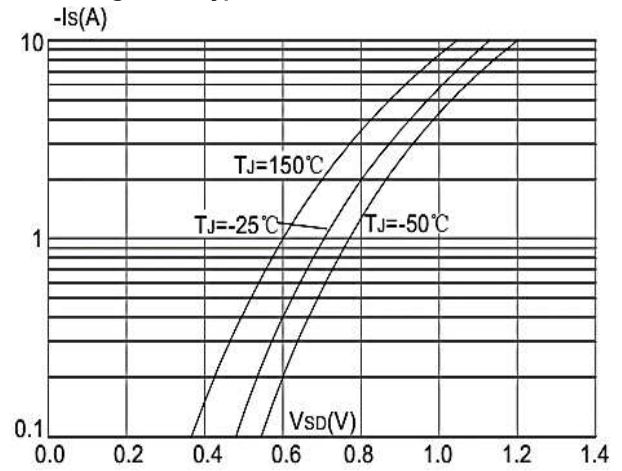


Figure 4: Body Diode Characteristics

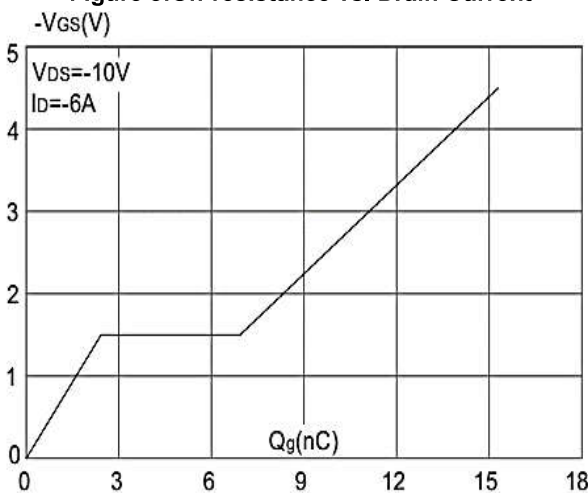


Figure 5: Gate Charge Characteristics

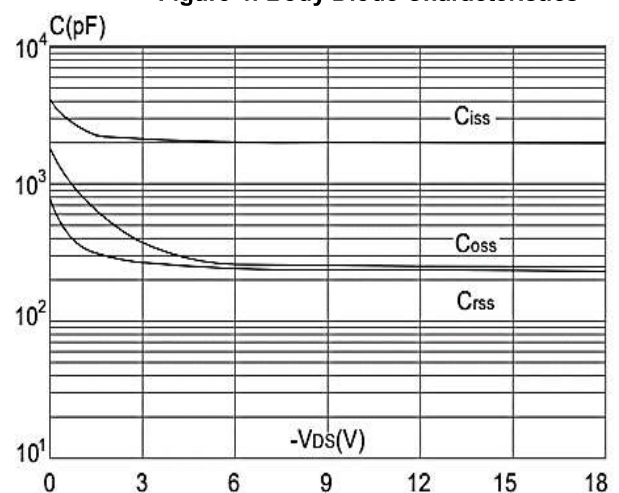


Figure 6: Capacitance Characteristics

Ratings and Characteristic Curves

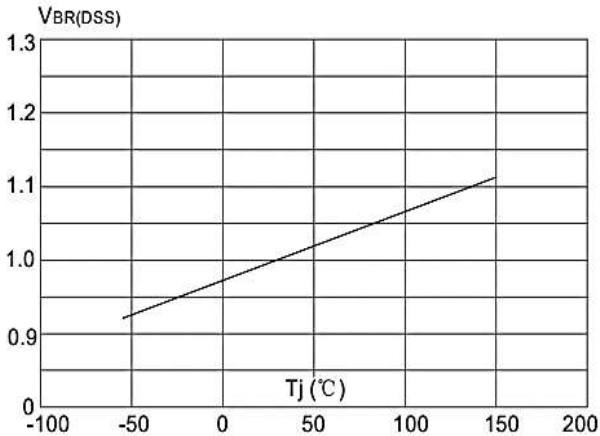


Figure 7: Normalized Breakdown Voltage vs Junction Temperature

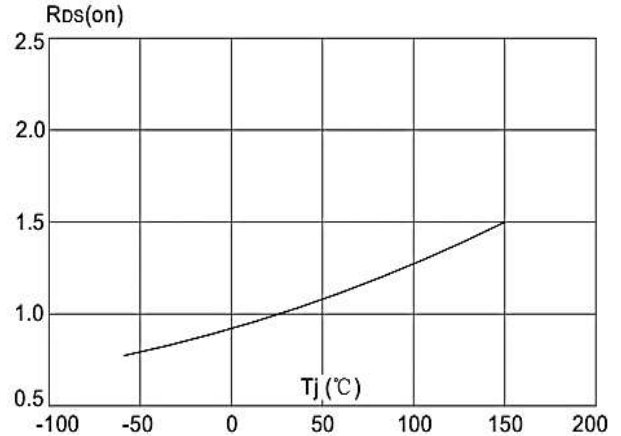


Figure 8: Normalized on Resistance vs. Junction Temperature

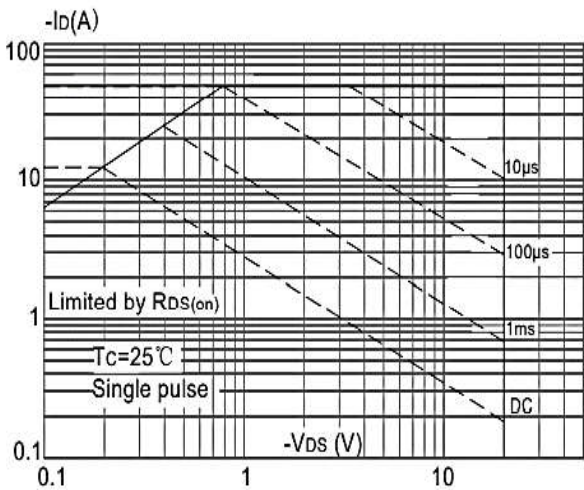


Figure 9: Maximum Safe Operating Area

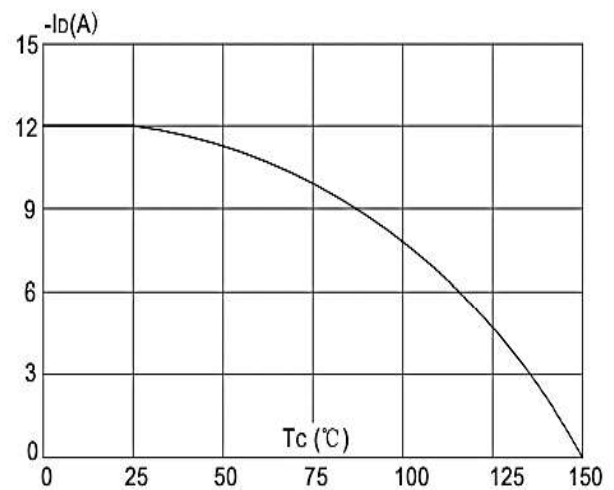


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

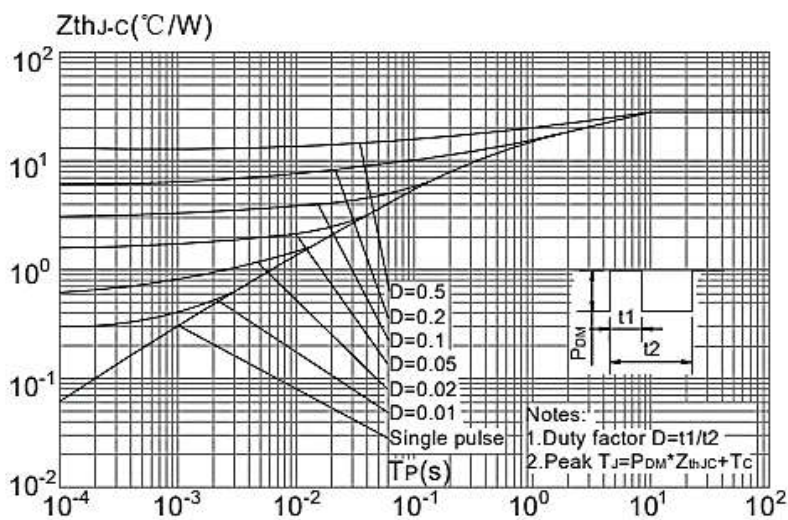
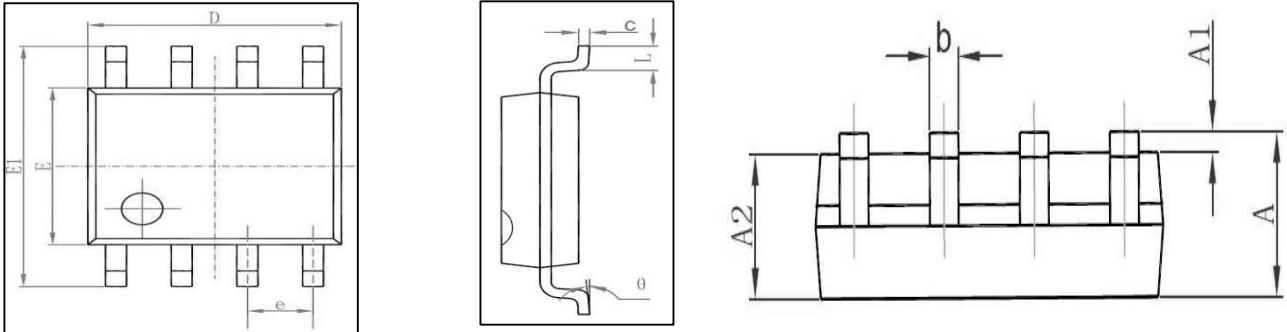
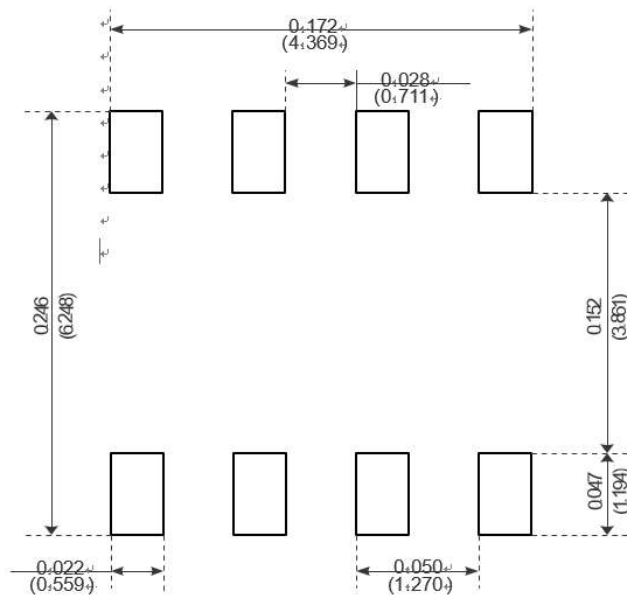


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambien

**SOP-8**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270 (BSC)		0.050 (BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°



Recommended Minimum Pads