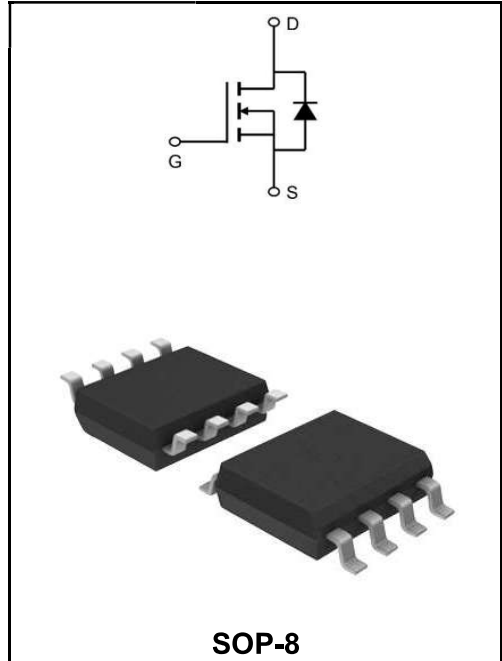


**30V N-CHANNEL ENHANCEMENT MODE MOSFET**

**MAIN CHARACTERISTICS**

<b>I<sub>D</sub></b>	12A
<b>V<sub>DSS</sub></b>	30V
<b>R<sub>DS(on)-typ</sub>(@V<sub>GS</sub>=10V)</b>	< 12mΩ ( <b>Type:8.5 mΩ</b> )



**Application**

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

**Product Specification Classification**

Part Number	Package	Marking	Pack
YFW4406AS	SOP-8	YFW 4406A XXXXX	3000PCS/Tape

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

Characteristics	Symbols	Value	Units
Drain-Source Voltage	<b>V<sub>DS</sub></b>	30	<b>V</b>
Gate - Source Voltage	<b>V<sub>GS</sub></b>	±20	<b>V</b>
Continuous Drain Current, V <sub>GS</sub> @ 10V <sup>1</sup> @T <sub>A</sub> =25°C	<b>I<sub>D</sub></b>	12	<b>A</b>
Continuous Drain Current, V <sub>GS</sub> @ 10V <sup>1</sup> @T <sub>A</sub> =70°C	<b>I<sub>D</sub></b>	8	<b>A</b>
Pulsed Drain Current <sup>note1</sup>	<b>I<sub>DM</sub></b>	48	<b>A</b>
Single Pulse Avalanche Energy <sup>note2</sup>	<b>E<sub>AS</sub></b>	16	<b>mJ</b>
Total Power Dissipation <sup>4</sup> @T <sub>A</sub> =25°C	<b>P<sub>D</sub></b>	3	<b>W</b>
Thermal Resistance Junction to ambient	<b>R<sub>θJA</sub></b>	46	<b>°C/W</b>
Operating and Storage Temperature Range	<b>T<sub>J</sub> , T<sub>STG</sub></b>	-55 to +150	<b>°C</b>

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

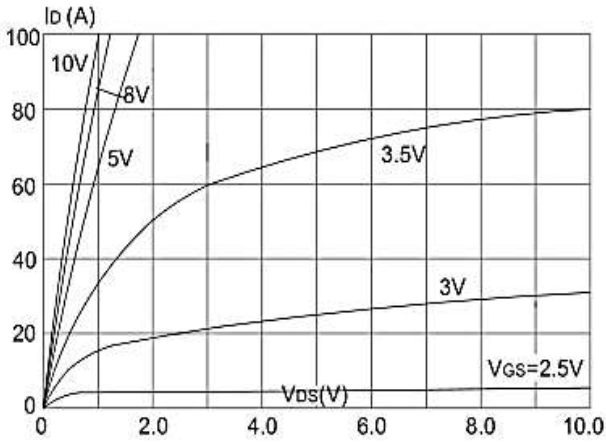
Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	<b>V(BR)DSS</b>	30	33	-	<b>V</b>
Zero Gate Voltage Drain Current	$V_{DS}=30V, V_{GS}=0V$	<b>I<sub>DSS</sub></b>	-	-	1.0	<b>μA</b>
Gate to Body Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	<b>I<sub>GSS</sub></b>	-	-	±100	<b>nA</b>
Gate -Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	<b>V<sub>GS(th)</sub></b>	1.2	1.6	2.5	<b>V</b>
Static Drain-Source On-Resistance note3	$V_{GS}=10V, I_D=13A$	<b>R<sub>DS(ON)</sub></b>	-	8.5	12	<b>mΩ</b>
	$V_{GS}=4.5V, I_D=10A$		-	13	18	
Input Capacitance	$V_{DS}=15V$ $V_{GS}=0V$ $f=1.0MHz$	<b>C<sub>iss</sub></b>	-	900	-	<b>pF</b>
Output Capacitance		<b>C<sub>oss</sub></b>	-	140	-	
Reverse Transfer Capacitance		<b>C<sub>rss</sub></b>	-	120	-	
Total Gate Charge	$V_{DS}=15V$ $I_D=10A$ $V_{GS}=10V$	<b>Q<sub>g</sub></b>	-	19	-	<b>nC</b>
Gate-Source Charge		<b>Q<sub>gs</sub></b>	-	6.3	-	
Gate-Drain("Miller") Charge		<b>Q<sub>gd</sub></b>	-	4.5	-	
Turn-on delay time	$V_{DS}=15V$ $I_D=6A$ $R_{GEN}=3\Omega$ $V_{GS}=10V$	<b>t<sub>d(on)</sub></b>	-	6	-	<b>ns</b>
Turn-on Rise Time		<b>T<sub>r</sub></b>	-	5	-	
Turn-Off Delay Time		<b>t<sub>d(OFF)</sub></b>	-	25	-	
Turn-on Fall Time		<b>t<sub>f</sub></b>	-	7	-	
Maximum Continuous Drain to Source Diode Forward Current		<b>I<sub>S</sub></b>	-	-	12	<b>A</b>
Maximum Pulsed Drain to Source Diode Forward Current		<b>I<sub>SM</sub></b>	-	-	48	<b>A</b>
Drain to Source Diode Forward Voltage	$V_{GS}=0V, I_S=20A$	<b>V<sub>SD</sub></b>	-	-	1.2	<b>V</b>
Body Diode Reverse Recovery Time	$I_F=10A, di/dt=100A/\mu s$	<b>t<sub>rr</sub></b>	-	7	-	<b>ns</b>
Body Diode Reverse Recovery Charge		<b>Q<sub>rr</sub></b>	-	6.3	-	<b>nC</b>

Note :

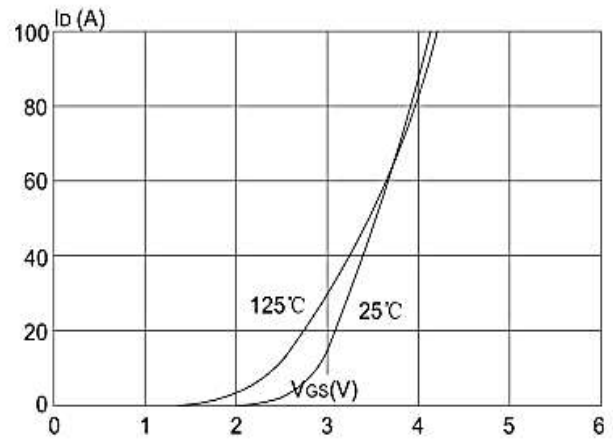
- 1、 The data tested by surface mounted on a 1 inch FR-4 board with 2OZ copper.
- 2、 The data tested by pulsed , Pulse Width≤300μs, Duty Cycle≤0.5%
- 3、 The EAS data shows Max. rating . The test condition is T<sub>J</sub>=25°C, V<sub>GS</sub>=10V, R<sub>G</sub>=25Ω, L=0.5mH, I<sub>AS</sub>=8A
- 4、 The power dissipation is limited by 150°C junction temperature
- 5、 The data is theoretically the same as I<sub>D</sub> and I<sub>DM</sub> , in real applications , should be limited by total power dissipation.

**Ratings and Characteristic Curves**

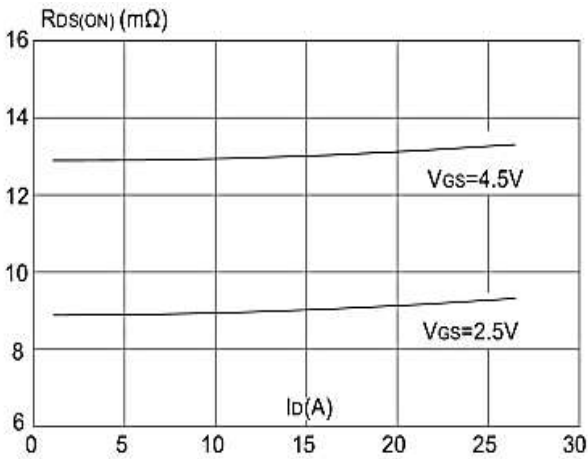
**Typical Characteristics**



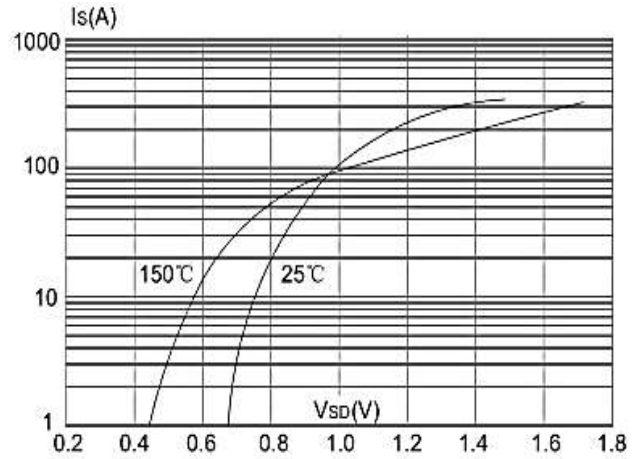
**Figure 1: Output Characteristics**



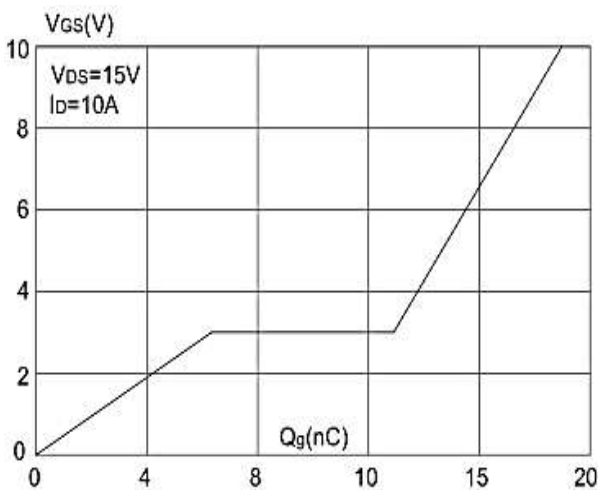
**Figure 2: Typical Transfer Characteristics**



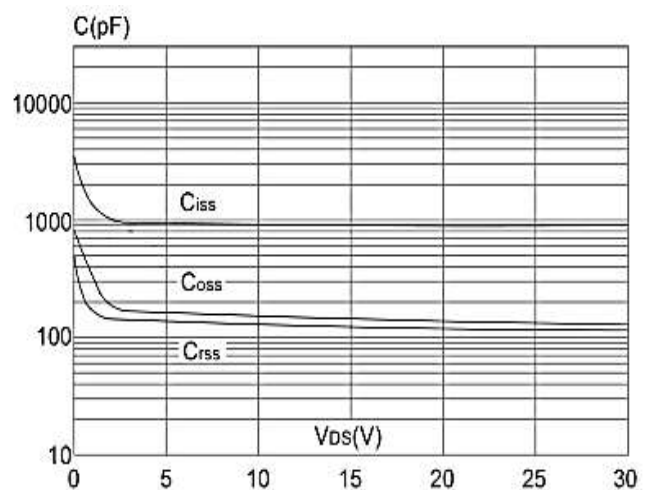
**Figure 3: On-resistance vs. Drain Current**



**Figure 4: Body Diode Characteristics**



**Figure 5: Gate Charge Characteristics**



**Figure 6: Capacitance Characteristics**

Ratings and Characteristic Curves

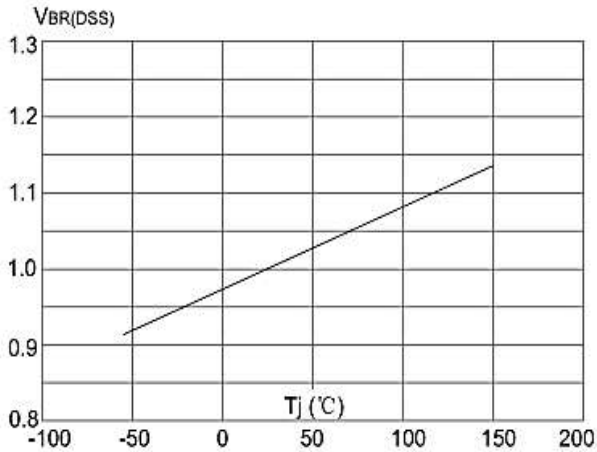


Figure 7: Normalized Breakdown Voltage vs Junction Temperature

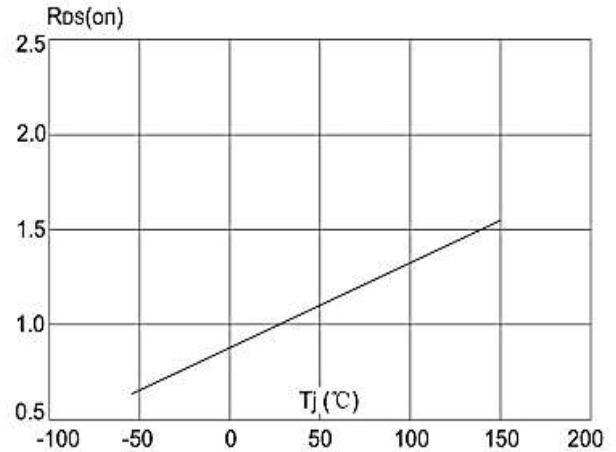


Figure 8: Normalized on Resistance vs. Junction Temperature

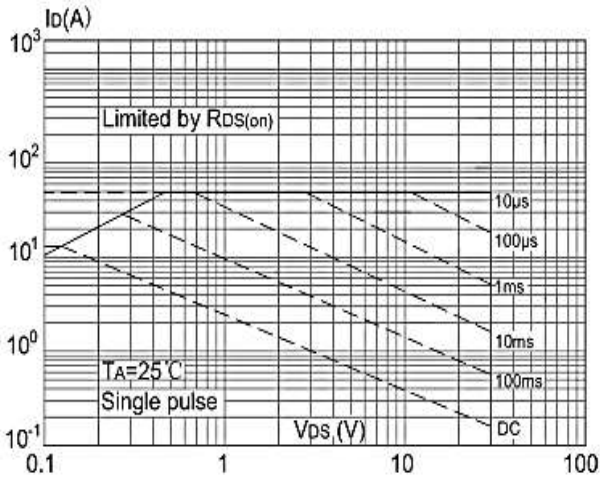


Figure 9: Maximum Safe Operating Area

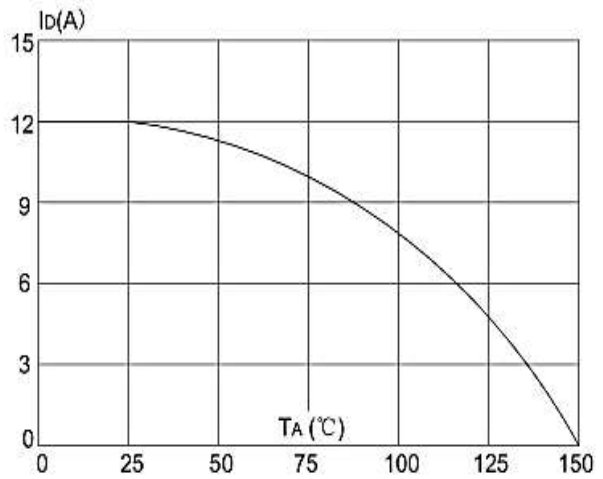


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

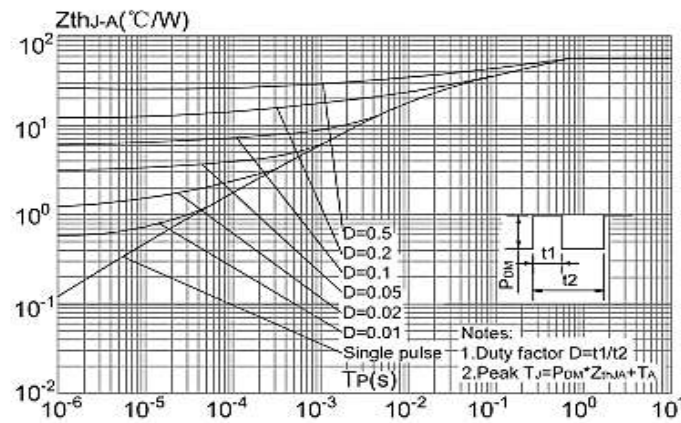
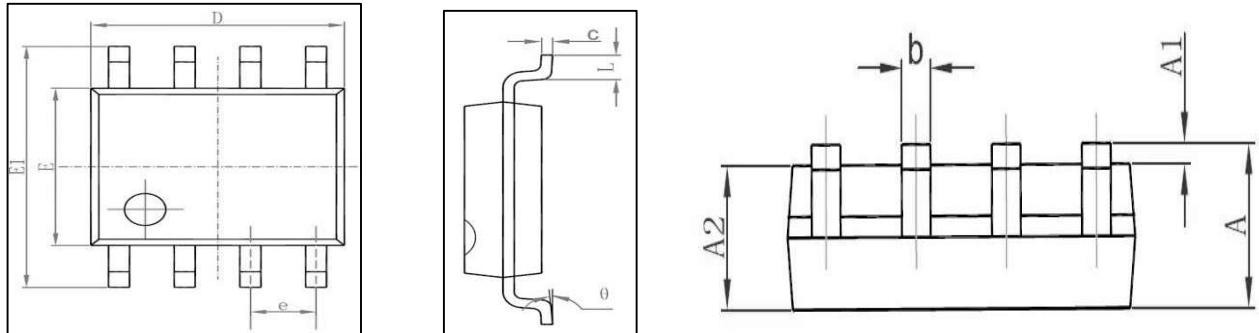
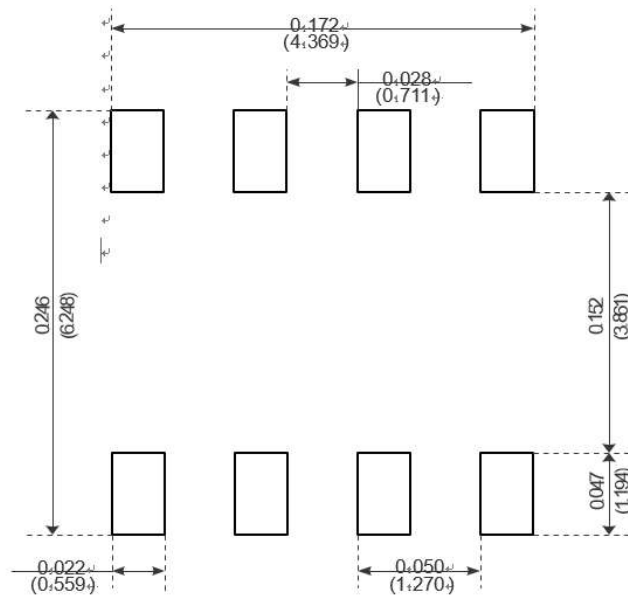


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambien

**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