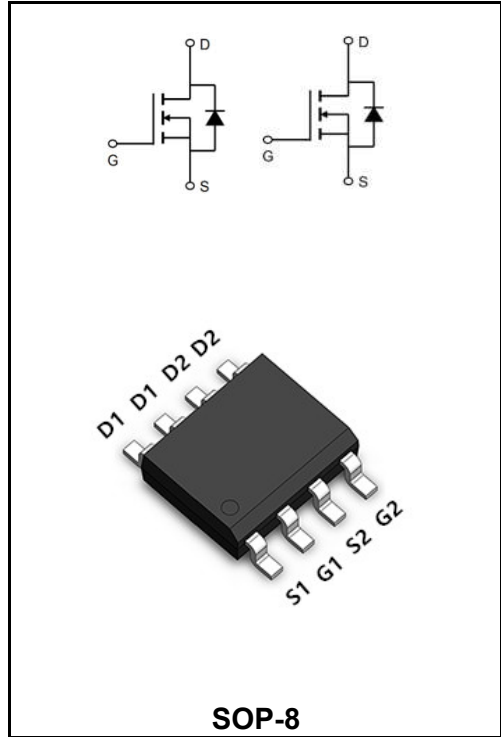


60V N+N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	7.2A
V_{DSS}	60V
R_{DS(on)-typ(@V_{GS}=10V)}	< 35mΩ(Type:28 mΩ)



Application

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

Product Specification Classification

Part Number	Package	Marking	Pack
YFW6946S	SOP-8	YFW 6946S XXXXX	3000PCS/Tape

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V_{DS}	60	V
Gate - Source Voltage	V_{GS}	±20	V
Continuous Drain Current, V _{GS} @ 10V ¹ @T _A =25°C	I_D	7.2	A
Continuous Drain Current, V _{GS} @ 10V ¹ @T _A =70°C	I_D	4.8	A
Pulsed Drain Current ²	I_{DM}	14.6	A
Single Pulse Avalanche Energy ³	E_{AS}	21.5	mJ
Avalanche Current	I_{AS}	20.6	A
Total Power Dissipation ⁴ @T _A =25°C	P_D	1.2	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}	62.5	°C/W
Thermal Resistance Junction-Case ¹	R_{θJC}	36	°C/W

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	V(BR)DSS	60	65	-	V
Zero Gate Voltage Drain Current	$V_{DS}=60V, V_{GS}=0V$	I_{DSS}	-	-	1.0	μA
Gate to Body Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	I_{GSS}	-	-	±100	nA
Gate -Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	V_{GS(th)}	1.0	1.6	2.5	V
Static Drain-Source On-Resistance note3	$V_{GS}=10V, I_D=10A$	R_{DS(ON)}	-	28	35	mΩ
	$V_{GS}=4.5V, I_D=5A$		-	33	45	mΩ
Input Capacitance	$V_{DS}=25V$ $V_{GS}=0V$ $f=1.0MHz$	C_{iss}	-	1148	-	μF
Output Capacitance		C_{oss}	-	58.5	-	
Reverse Transfer Capacitance		C_{rss}	-	49.4	-	
Total Gate Charge	$V_{DS}=30V$ $I_D=10A$ $V_{GS}=10V$	Q_g	-	20.3	-	nC
Gate-Source Charge		Q_{gs}	-	3.7	-	
Gate-Drain("Miller") Charge		Q_{gd}	-	5.3	-	
Turn-on delay time	$V_{DS}=30V$ $I_D=20A$ $R_{GEN}=1.8\Omega$ $V_{GS}=10V$	t_{d(on)}	-	7.6	-	ns
Turn-on Rise Time		T_r	-	20	-	
Turn-Off Delay Time		t_{d(OFF)}	-	15	-	
Turn-Off Fall Time		t_f	-	24	-	
Maximum Continuous Drain to Source Diode Forward Current		I_S	-	-	20	A
Maximum Pulsed Drain to Source Diode Forward Current		I_{SM}	-	-	80	A
Drain to Source Diode Forward Voltage	$V_{GS}=0V, I_S=20A$	V_{SD}	-	-	1.2	V
Body Diode Reverse Recovery Time	$I_F=20A, di/dt=100A/\mu s$	t_{rr}	-	29	-	ns
Body Diode Reverse Recovery Charge		Q_{rr}	-	43	-	nC

Notes:

- 1、 Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
- 2、 EAS condition : T_J =25°C, V_{DD} =30V, V_G =10V, L=0.5mH, R_G=25Ω, I_{AS} =8.5A
- 3、 Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

Ratings and Characteristic Curves

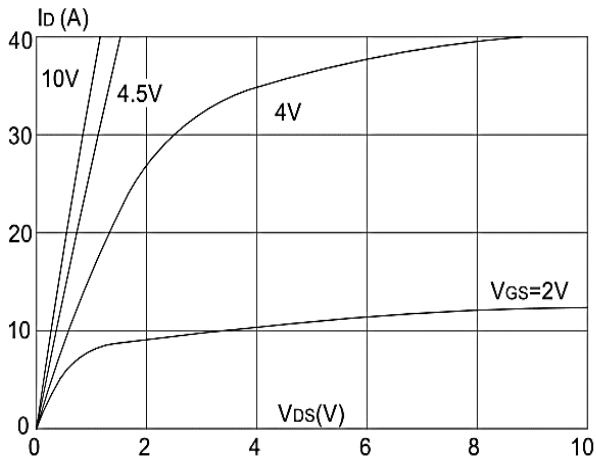


Figure 1: Output Characteristics

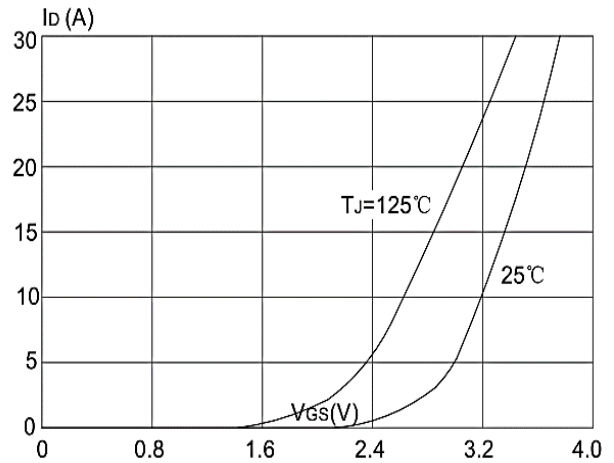


Figure 2: Typical Transfer Characteristics

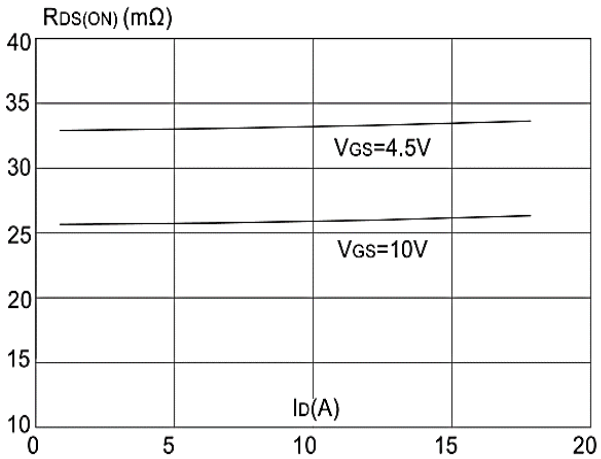


Figure 3: On-resistance vs. Drain Current

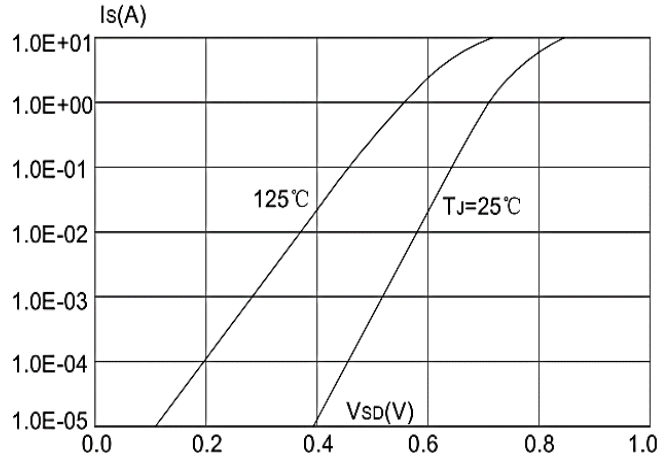


Figure 4: Body Diode Characteristics

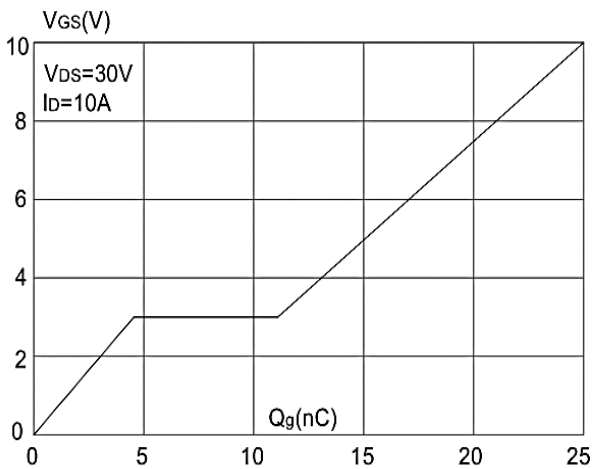


Figure 5: Gate Charge Characteristics

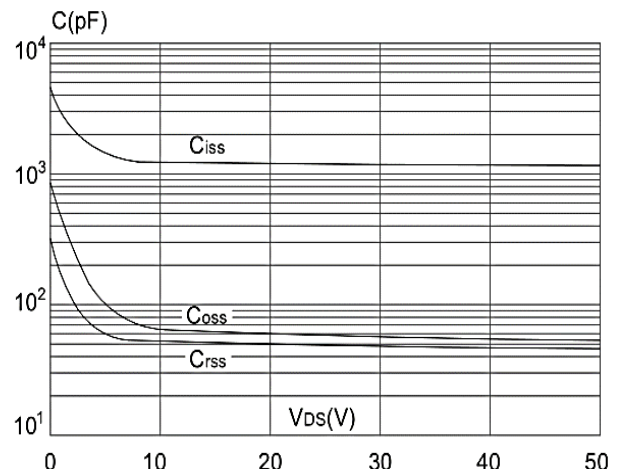


Figure 6: Capacitance Characteristics

Ratings and Characteristic Curves

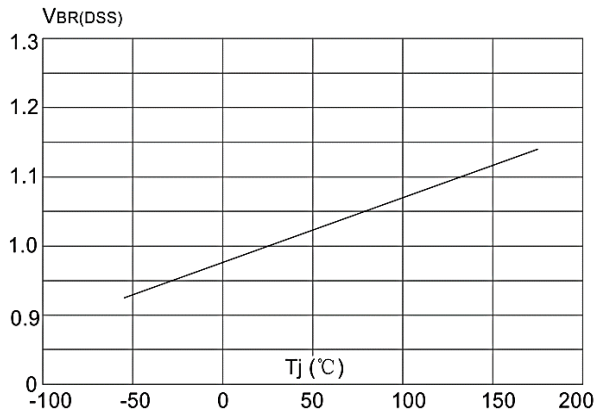


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

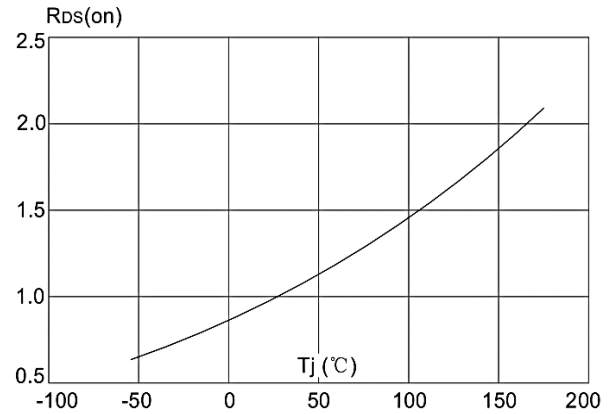


Figure 8: Normalized on Resistance vs. Junction Temperature

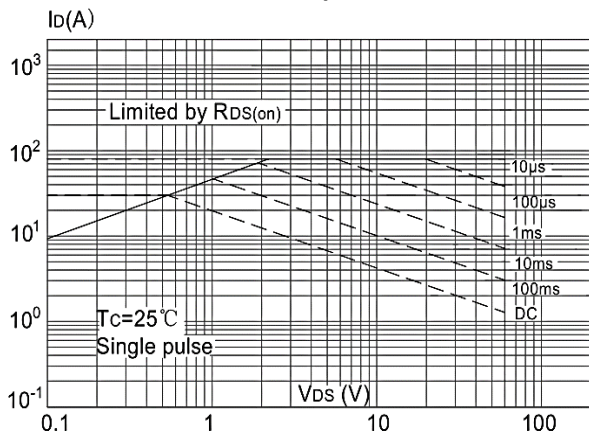


Figure 9: Maximum Safe Operating Area vs. Case Temperature

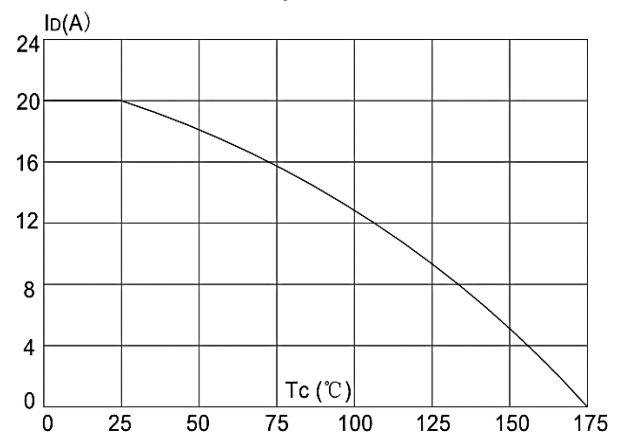


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

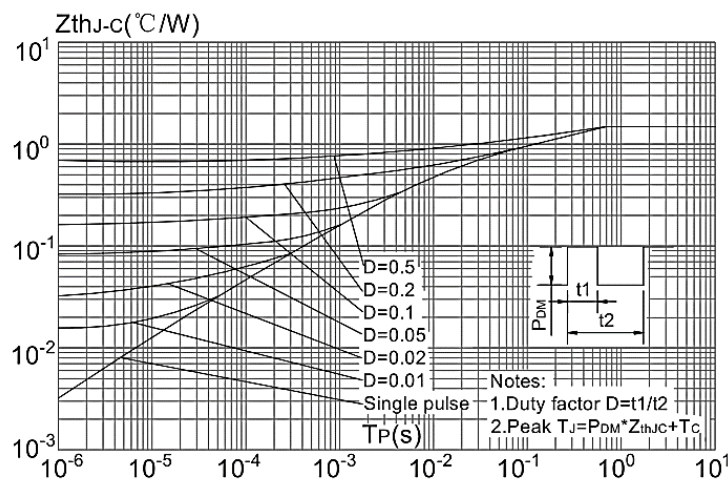
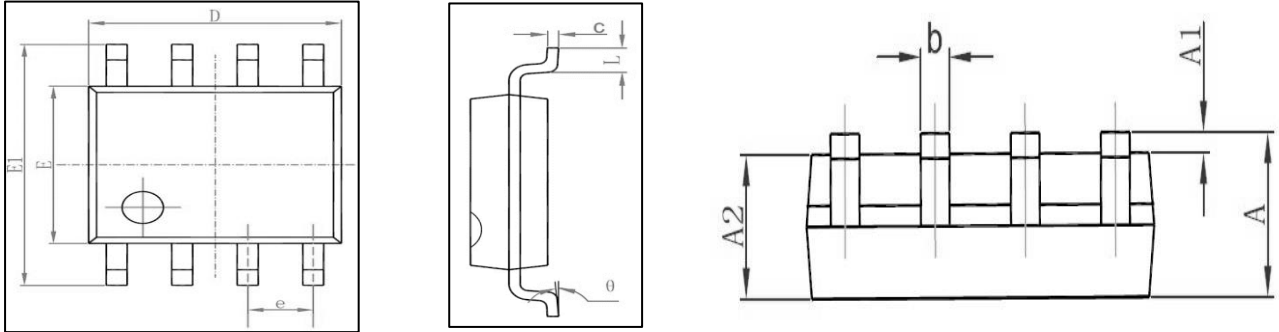
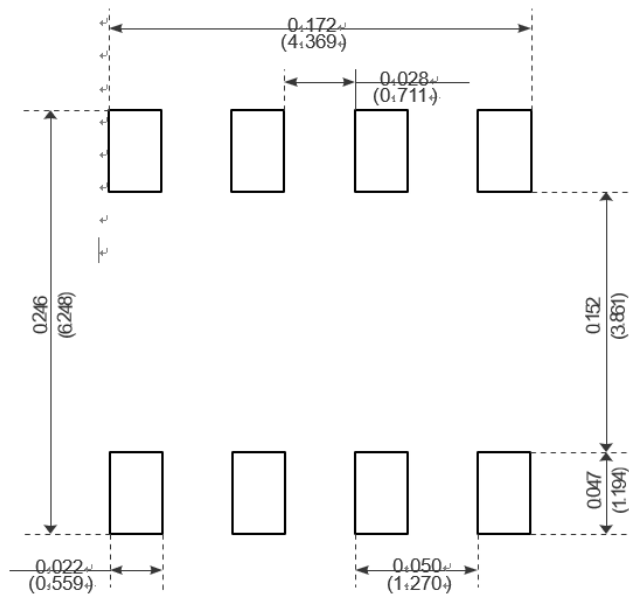


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

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