

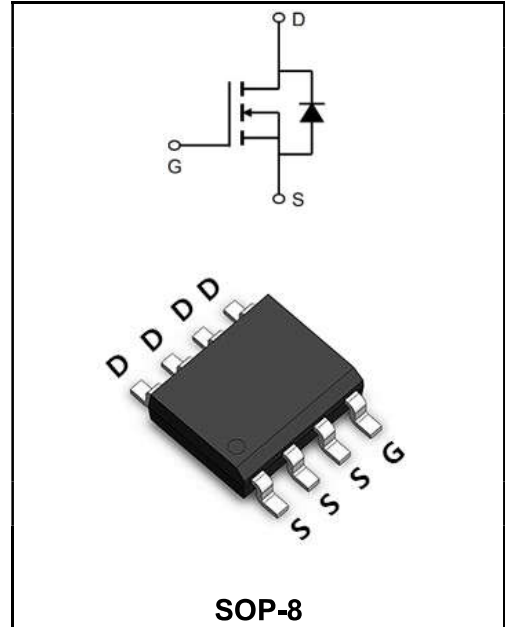
60V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	20A
V_{DSS}	60V
R_{DS(on)-typ}(@V_{GS}=10V)	< 10mΩ(Type:7.8 mΩ)

Application

- ◆ Battery protection
- ◆ Load switch
- ◆ synchronous rectification



Product Specification Classification

Part Number	Package	Marking	Pack
YFW20N06S	SOP-8	YFW 20N06S XXXXX	3000PCS/Tape

Maximum Ratings at T_c=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 _C =25°C	I_D	20	A
Continuous Drain Current, V _{GS} @ 10V ¹ @T _C =100°C	I_D	13	A
Pulsed Drain Current ²	I_{DM}	80	A
Single Pulse Avalanche Energy ³	E_{AS}	140	mJ
Total Power Dissipation ⁴ @T _C =25°C	P_D	116	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}	46	°C/W
Thermal Resistance Junction-Case ¹	R_{θJC}	0.85	°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}	60	72	-	V
BVDSS Temperature Coefficient	Reference to 25°C , $I_D=1mA$	$\Delta BV_{DSS}/\Delta T_J$	-	0.023	-	V/°C
Static Drain-Source On-Resistance ²	$V_{GS}=10V, I_D=10A$	$R_{DS(ON)}$	-	7.8	10	mΩ
Gate -Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	$V_{GS(th)}$	2.0	3.0	4.0	V
$V_{GS(th)}$ Temperature Coefficient		$\Delta V_{GS(th)}$	-	-4.2	-	mV/°C
Drain -Source Leakage Current	$V_{DS}=24V, V_{GS}=0V, T_J=25^\circ C$	I_{DSS}	-	-	1	μA
	$V_{DS}=24V, V_{GS}=0V, T_J=55^\circ C$		-	-	5	
Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	I_{GSS}	-	-	±100	nA
Forward Transconductance	$V_{DS}=5V, I_D=10A$	g_{FS}	-	5.5	-	S
Gate Resistance	$V_{DS}=0V, V_{GS}=0V, f=1MHz$	R_g	-	2.3	-	Ω
Total Gate Charge(4.5V)	$V_{DS}=30V$ $V_{GS}=10V$ $I_D=20A$	Q_g	-	35	-	nC
Gate-Source Charge		Q_{gs}	-	11	-	
Gate-Drain Charge		Q_{gd}	-	9	-	
Turn-on delay time	$V_{DS}=30V$ $I_D=20A$ $R_{GEN}=6\Omega$ $V_{GS}=10V$	$t_{d(on)}$	-	15	-	ns
Rise Time		T_r	-	94	-	
Turn-Off Delay Time		$t_{d(OFF)}$	-	46	-	
Fall Time		t_f	-	32	-	
Input Capacitance	$V_{DS}=15V$ $V_{GS}=0V$ $f=1.0MHz$	C_{iss}	-	4062	-	pF
Output Capacitance		C_{oss}	-	261	-	
Reverse Transfer Capacitance		C_{rss}	-	231	-	
Continuous Source Current ^{1,5}	$V_G=V_D=0V, \text{ Force Current}$	I_S	-	-	80	A
Pulsed Source Current ^{2,5}		I_{SM}	-	-	320	A
Diode Forward Voltage ²	$V_{GS}=0V, I_S=80A$	V_{SD}	-	-	1.2	V
Reverse Recovery Time	$I_F=20A, dI/dt=100A/\mu s,$ $T_J=25^\circ C$	t_{rr}	-	78	-	ns
Reverse Recovery Charge		Q_{rr}	-	51	-	nC

Note :

- 1、 The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.
- 2、 The data tested by pulsed , pulse width .The EAS data shows Max. rating .
- 3、 The power dissipation is limited by 175°C junction temperature
- 4、 The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

Ratings and Characteristic Curves

Typical Characteristics

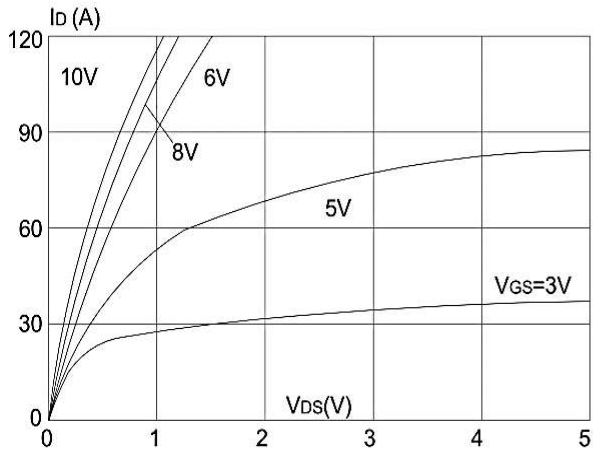


Figure 1: Output Characteristics

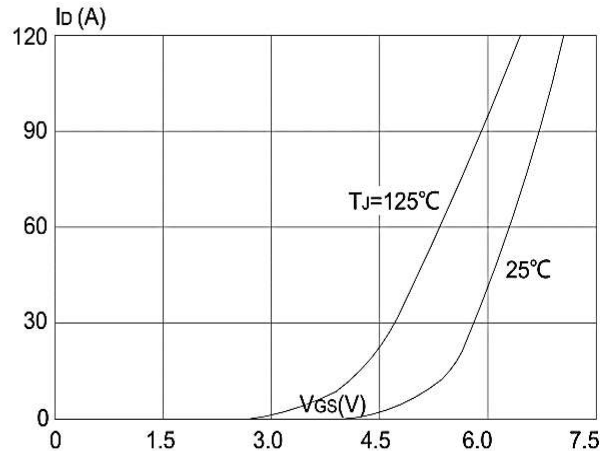


Figure 2: Typical Transfer Characteristics

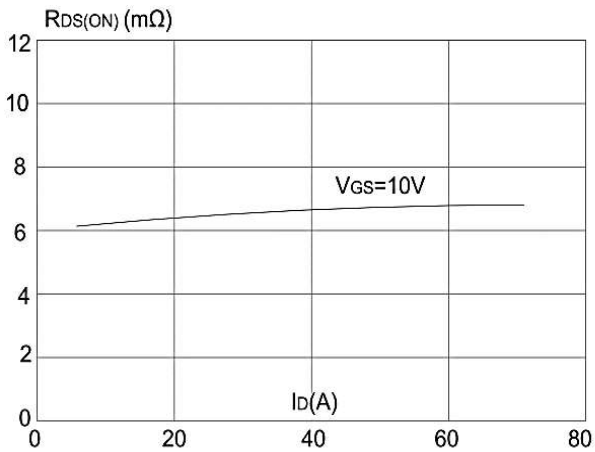


Figure 3: On-resistance vs. Drain Current

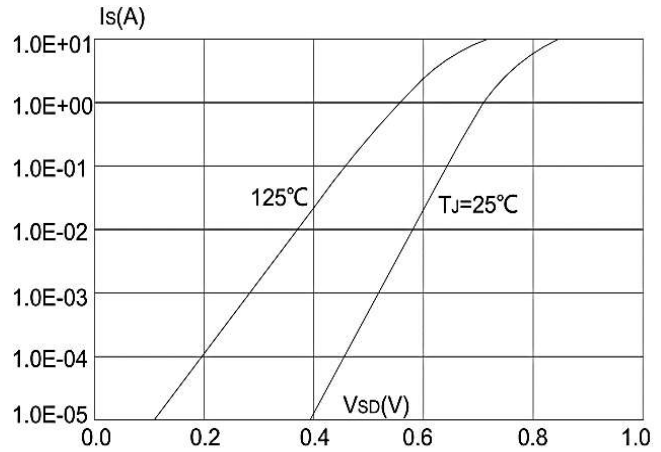


Figure 4: Body Diode Characteristics

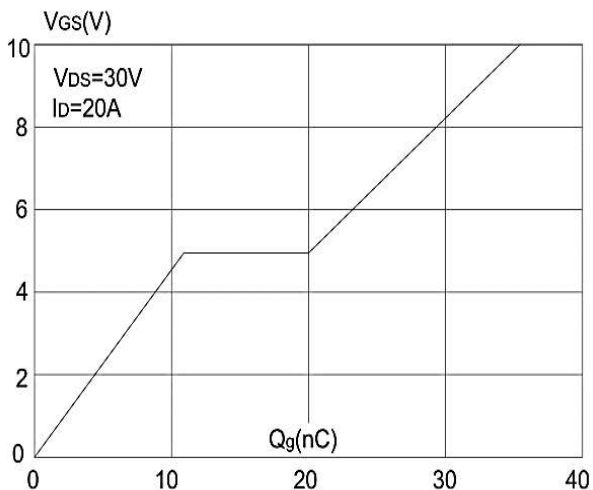


Figure 5: Gate Charge Characteristics

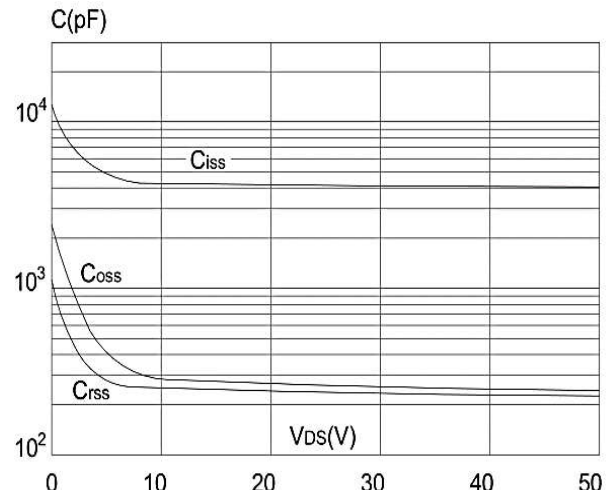


Figure 6: Capacitance Characteristics

Ratings and Characteristic Curves

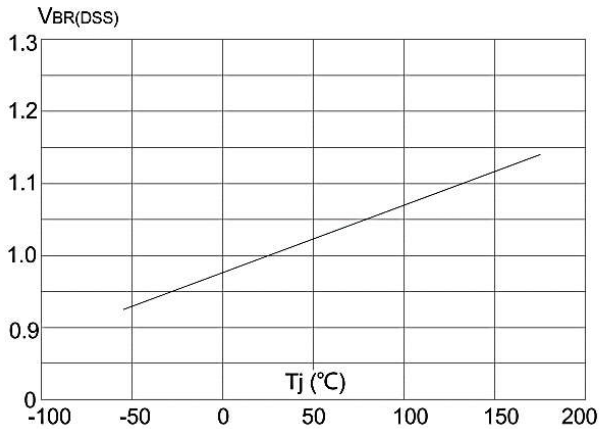


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

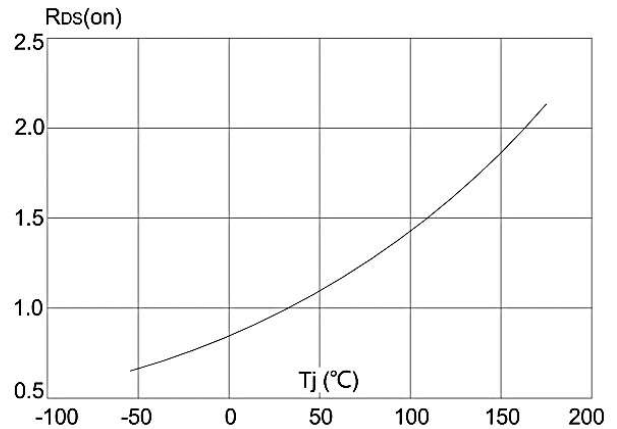


Figure 8: Normalized on Resistance vs. Junction Temperature

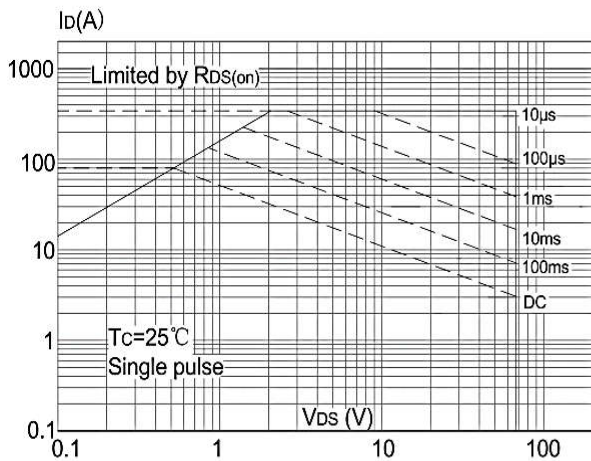


Figure 9: Maximum Safe Operating Area

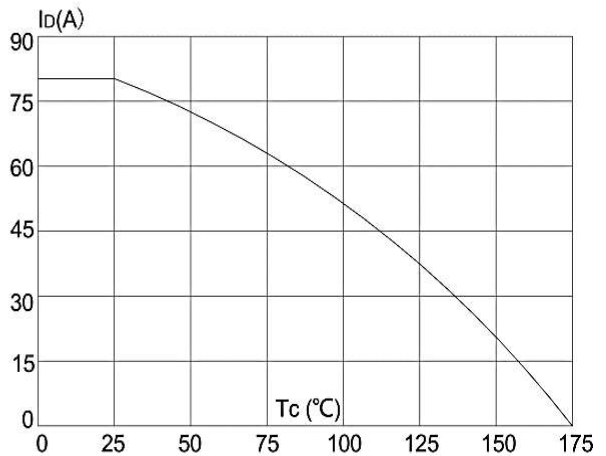


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

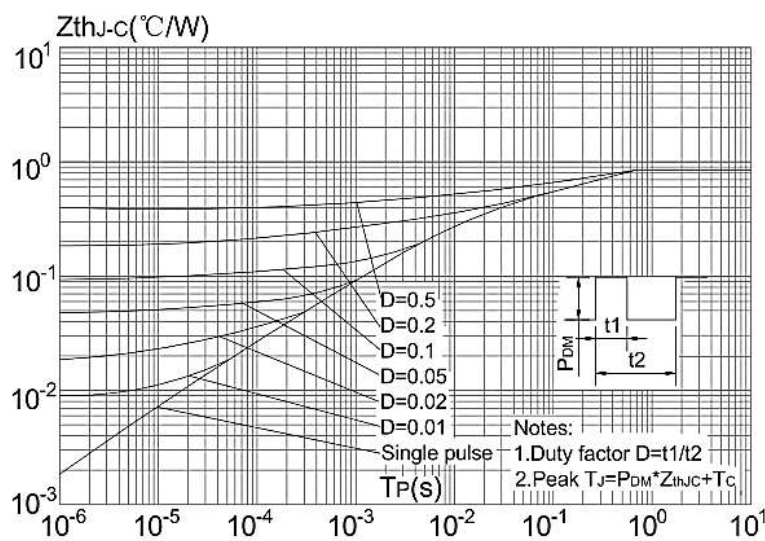
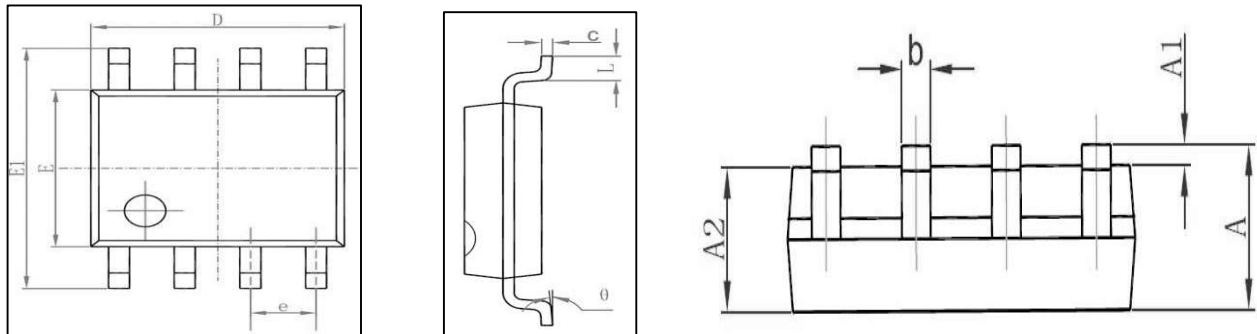
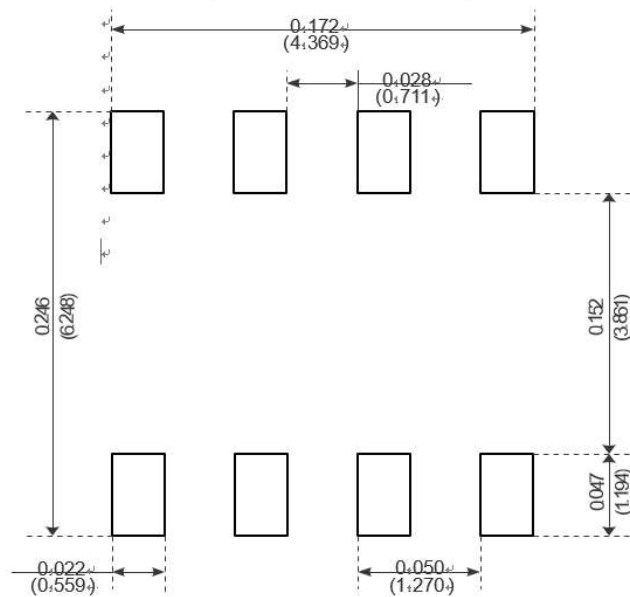


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambien

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