

60V N-Channel Enhancement Mode MOSFET

MAIN CHARACTERISTICS

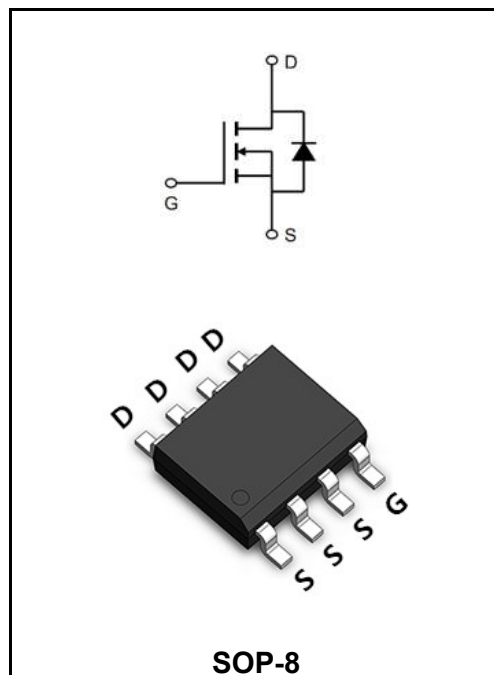
I_D	60A
V_{DS}	60V
$R_{DS(on)-typ}(@V_{GS}=10V)$	<10mΩ (Typ:7.5mΩ)
$R_{DS(on)-typ}(@V_{GS}=4.5V)$	<13mΩ (Typ:10mΩ)

Description

The YFW60N06S uses advanced trench technology to provide excellent $R_{DS(on)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

Applications

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



Absolute Maximum Ratings $T_c=25^\circ\text{C}$ unless otherwise noted

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V_{DS}	60	V
Gate - Source Voltage	V_{GS}	± 20	V
Drain Current – Continuous ($T_c=25^\circ\text{C}@10V^1$)	I_D	60	A
Drain Current – Continuous ($T_c=100^\circ\text{C}@10V^1$)		55	A
Pulsed Drain Current ⁽²⁾	I_{DM}	80	A
Single Pulsed Avalanche Energy ⁽³⁾	E_{AS}	140	mJ
Power Dissipation ($T_A=25^\circ\text{C}$)	P_D	3.5	W
Storage Temperature Range	T_{STG}	-55 to +150	$^\circ\text{C}$
Operating Junction Temperature Range	T_J	-55 to +150	$^\circ\text{C}$
Thermal Resistance Junction-ambient ⁽¹⁾	$R_{\theta JA}$	85	$^\circ\text{C/W}$
Thermal Resistance Junction-Case ⁽¹⁾	$R_{\theta JC}$	36	$^\circ\text{C/W}$

Electrical Characteristics (T_J=25℃, unless otherwise noted)

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	BV_{DSS}	60	68	-	V
Drain -Source Leakage Current	V _{DS} =60V , V _{GS} =0V	I_{DSS}	-	-	1.0	μA
Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	I_{GSS}	-	-	±100	nA
Gate -Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	V_{GS(th)}	1.0	1.7	2.0	V
Static Drain-Source On-Resistance	V _{GS} = 10 V, I _D =30A	R_{DS(ON)}	-	7.5	10	mΩ
	V _{GS} = 4.5 V, I _D =20A		-	10	13	mΩ
Total Gate Charge	V _{GS} = 10V V _{DS} = 50V I _D = 10A	Q_G	-	18.4	-	nC
Gate to Source Charge		Q_{GS}	-	3.3	-	nC
Gate to Drain Charge		Q_{GD}	-	3.1	-	nC
Gate plateau voltage		V _{plateau}		2.8		v
Turn-on delay time	V _{GS} =10 V, V _{DS} =50 V, R _G =2 Ω, I _D =10 A	t_{d(on)}	-	17.9	-	ns
Rise Time		T_r	-	4.0	-	ns
Turn-Off Delay Time		t_{d(OFF)}	-	34.9	-	ns
Fall Time		t_f	-	5.5	-	ns
Input Capacitance	V _{DS} =25V V _{GS} =0V F=1MHz	C_{iss}	-	1153	-	pF
Output Capacitance		C_{oss}	-	322	-	pF
Reverse Transfer Capacitance		C_{rss}	-	17	-	pF
Maximum Continuous Drain to Source Diode Forward Current		I_S	-	-	60	A
Maximum Pulsed Drain to Source Diode Forward Current		I_{SM}	-	-	80	A
Diode Forward Voltage	V _{GS} = 0V, I _S = 20A	V_{SD}	-	-	1.3	V
Body Diode Reverse Recovery Time	I _F = 10A, di/dt = 100A/us	t_{rr}	-	41.8	-	ns
Body Diode Reverse Recovery Charge		Q_{rr}	-	36.1	-	nC
Peak reverse recovery current		I_{rrm}	-	1.4	-	A

Note

- 1、Calculated continuous current based on maximum allowable junction temperature.
- 2、Repetitive rating; pulse width limited by max. junction temperature.
- 3、Pd is based on max. junction temperature, using junction-case thermal resistance.
- 4、V_{DD}=50 V, R_G=50Ω, L=0.3 mH, starting T_J=25 ℃.
- 5、The value of R_{θJA} is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with T_a=25 ℃.

Typical Characteristics

Figure 1. Output Characteristics

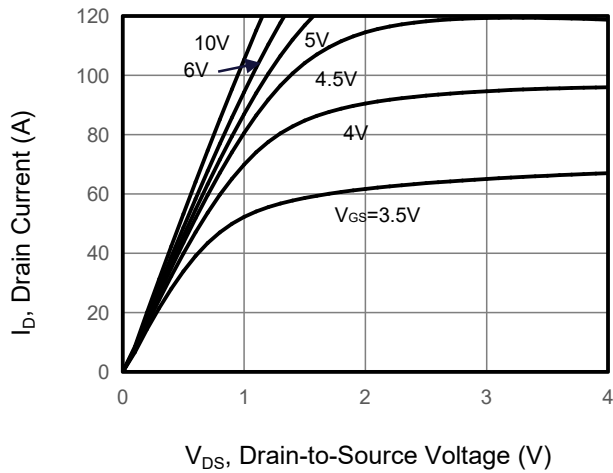


Figure 2. Transfer Characteristics

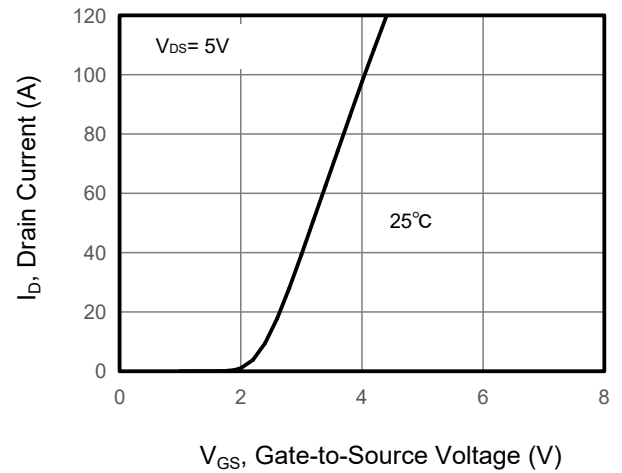


Figure 3. Drain Source On Resistance

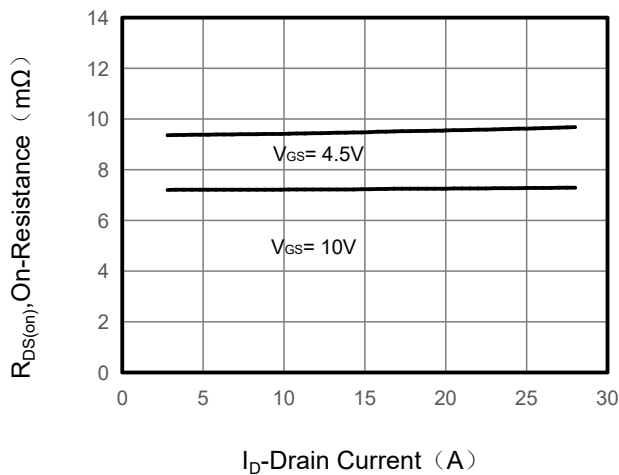


Figure 4. Gate Charge

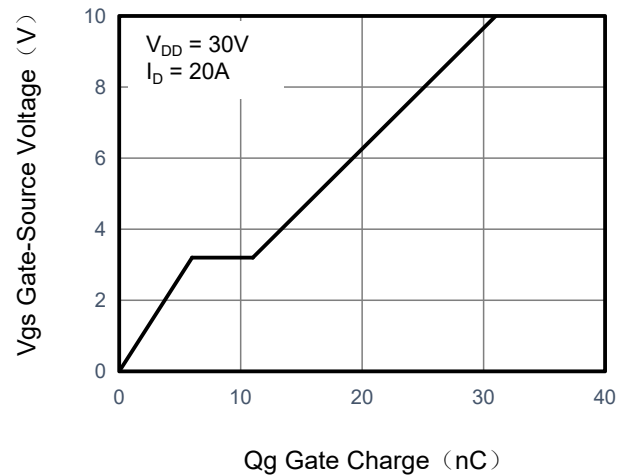


Figure 5. Capacitance

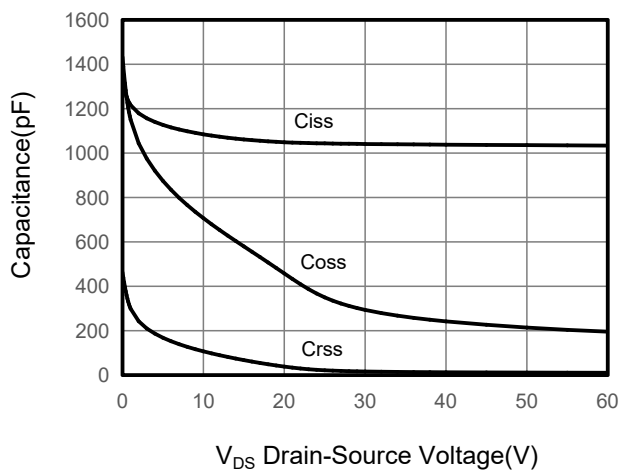
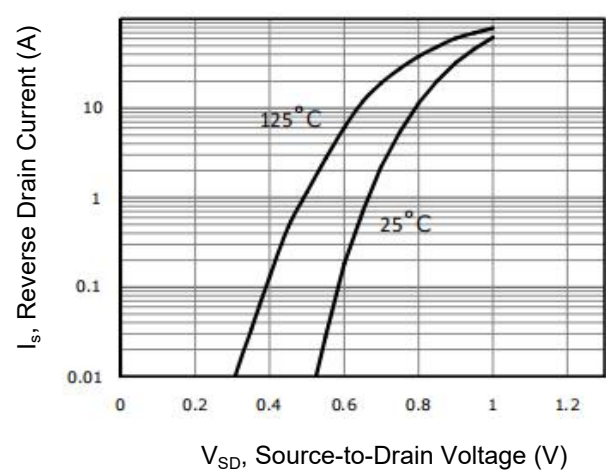


Figure 6. Source-Drain Diode Forward



Typical Characteristics

Figure 7. Drain-Source On-Resistance

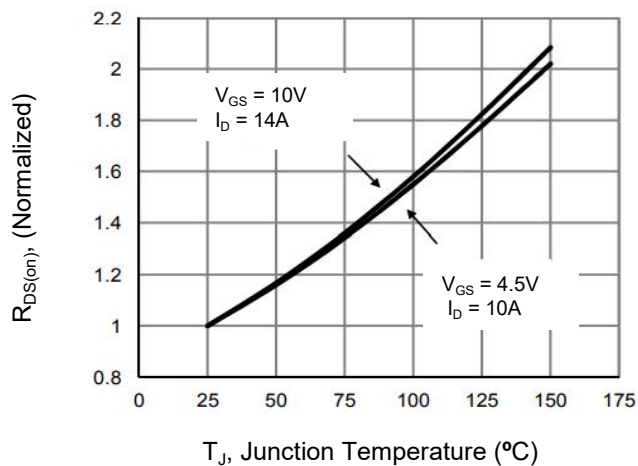


Figure 8. Safe Operation Area

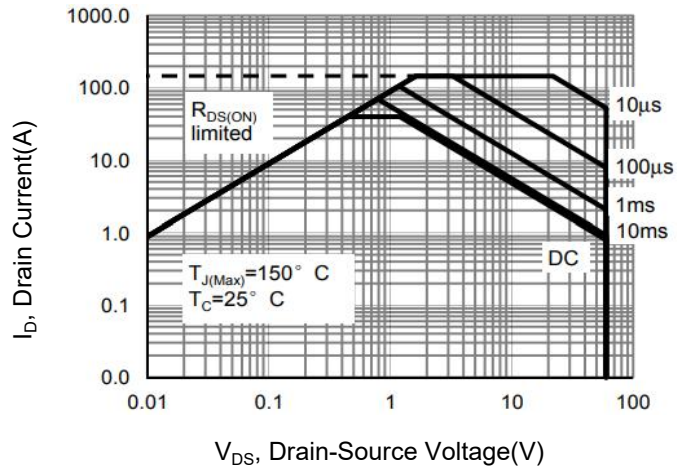
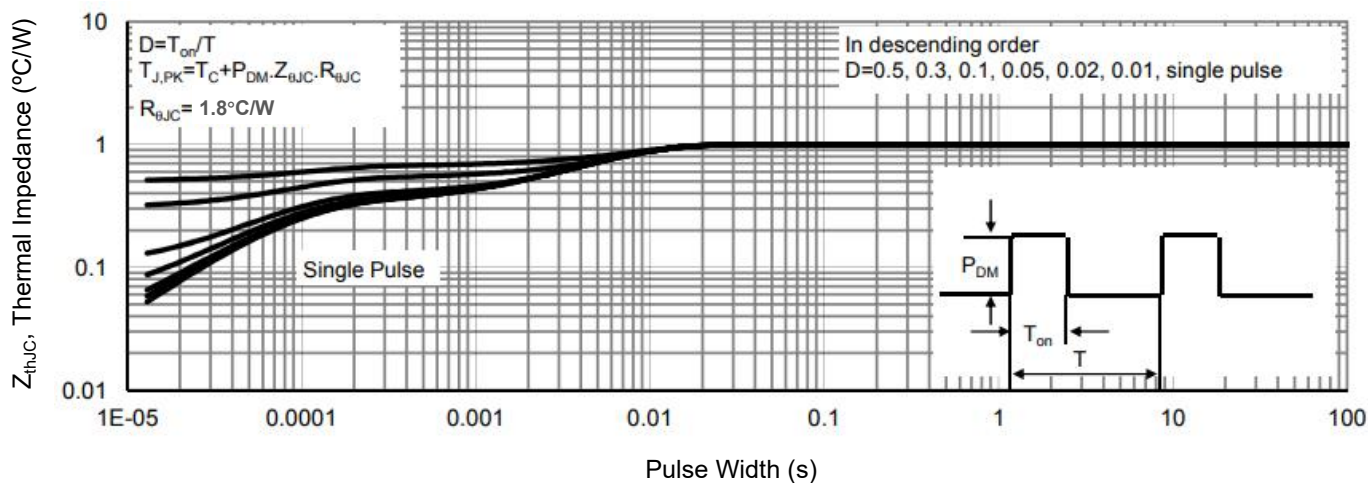
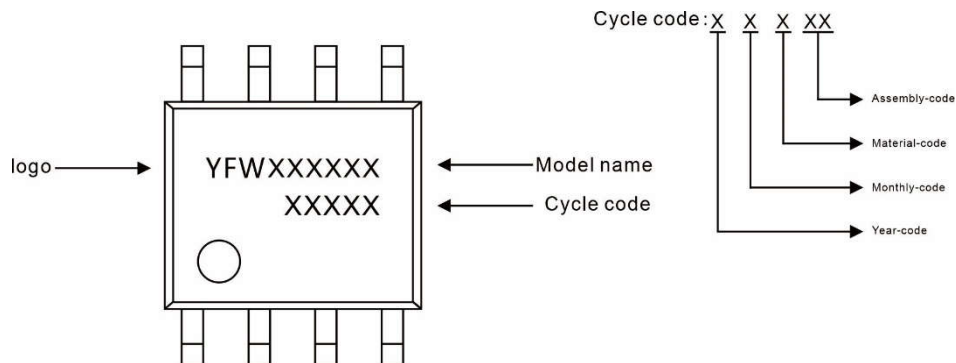


Figure 9. Normalized Maximum Transient Thermal Impedance



Marking Diagram



Ordering information

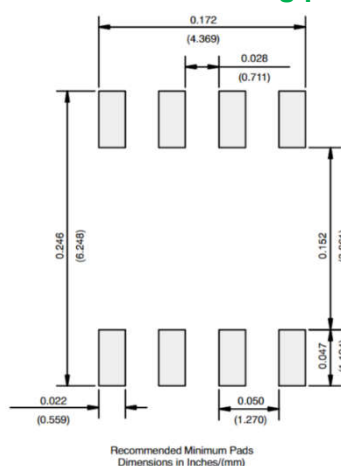
Package	Packing Description	Packing Quantity
SOP-8	Tape/Reel, 13" reel	3000PCS/Reel 30000PCS/Carton

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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