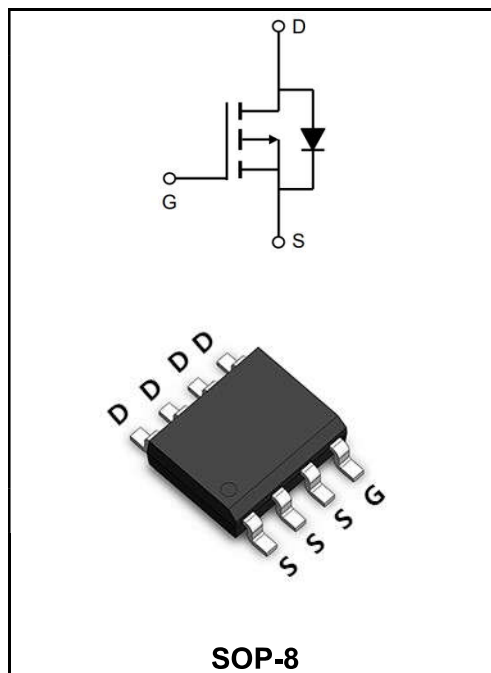


-30V P-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	-15A
V_{DSS}	-30V
$R_{DS(on)}-typ(@V_{GS}=-10V)$	$< 9.0m\Omega$ (Typ: 7.2m Ω)
$R_{DS(on)}-typ(@V_{GS}=-4.5V)$	$< 12.5m\Omega$ (Typ: 10.0m Ω)



DESCRIPTION

The YFW4409AS 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.

APPLICATION

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

Maximum Ratings at $T_c=25^\circ\text{C}$ unless otherwise specified

Characteristics		Symbols	Value	Units
Drain-Source Voltage		V_{DS}	-30	V
Gate - Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	$T_A=25^\circ\text{C}$	I_D	-15	A
Continuous Drain Current	$T_A=100^\circ\text{C}$	I_D	-10	A
Pulsed Drain Current ⁽¹⁾		I_{DM}	-60	A
Single Pulse Avalanche Energy ⁽²⁾		E_{AS}	132	mJ
Total Power Dissipation	$T_A=25^\circ\text{C}$	P_D	1.7	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 ⁽³⁾		$R_{\theta JA}$	73	$^\circ\text{C/W}$

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$I_D = -250\mu A$, $V_{GS} = 0V$	BV_{DSS}	-30	-	-	V
Zero Gate Voltage Drain Current	$V_{DS} = -30V$, $V_{GS} = 0V$	I_{DSS}	-	-	1.0	μA
Gate-Body Leakage Current	$V_{DS} = 0V$, $V_{GS} = \pm 20V$	I_{GSS}	-	-	± 100	nA
Gate Threshold Voltage	$V_{DS} = V_{GS}$, $I_D = -250\mu A$	$V_{GS(th)}$	-1.0	-1.5	-2.5	V
Static Drain-Source ON-Resistance ⁽⁴⁾	$V_{GS} = -10V$, $I_D = -15A$	$R_{DS(ON)}$	-	7.2	9.0	m Ω
	$V_{GS} = -4.5V$, $I_D = -10A$		-	10.0	12.5	m Ω
Input Capacitance	$V_{GS} = 0V$ $V_{DS} = -15V$ $f = 1MHz$	C_{iss}	-	3366	-	μF
Output Capacitance		C_{oss}	-	471	-	
Reverse Transfer Capacitance		C_{rss}	-	324	-	
Total Gate Charge	$V_{GS} = 0$ to $-10V$ $V_{DS} = -15V$, $I_D = -10A$	Q_g	-	59	-	nC
Gate Source Charge		Q_{gs}	-	10	-	
Gate to Drain Charge		Q_{gd}	-	14	-	
Turn-On DelayTime	$V_{GS} = -10V$, $V_{DD} = -15V$ $I_D = -10A$, $R_{GEN} = 3\Omega$	$t_{d(on)}$	-	7	-	ns
Turn-On Rise Time		T_r	-	6	-	
Turn-Off DelayTime		$t_{d(OFF)}$	-	112	-	
Turn-Off Fall Time		t_f	-	78	-	
Maximum Continuous Drain to Source Diode Forward Current		I_S	-	-	-15	A
Maximum Pulsed Drain to Source Diode Forward Current		I_{SM}	-	-	-60	A
Drain to Source Diode Forward Voltage	$V_{GS} = 0V$, $I_S = -15A$	V_{SD}	-	-	-1.2	V
Body Diode Reverse Recovery Time	$I_F = -10A$, $di/dt = 100A/\mu s$	t_{rr}	-	21	-	ns
Body Diode Reverse Recovery Charge		Q_{rr}	-	10	-	nC

Notes:

1.Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

2.E_{AS} condition: Starting T_J=25°C, V_{DD}=-15V, V_G=-10V, R_G=25ohm, L=0.5mH, I_{AS}=-23A

3.R_{θJA} measured with the device mounted on a 1-inch² pad of 2oz copper FR4 PCB

4.Pulse Test: Pulse Width<300μs, Duty Cycle<0.5%.

Typical Characteristics

Figure 1: Output Characteristics

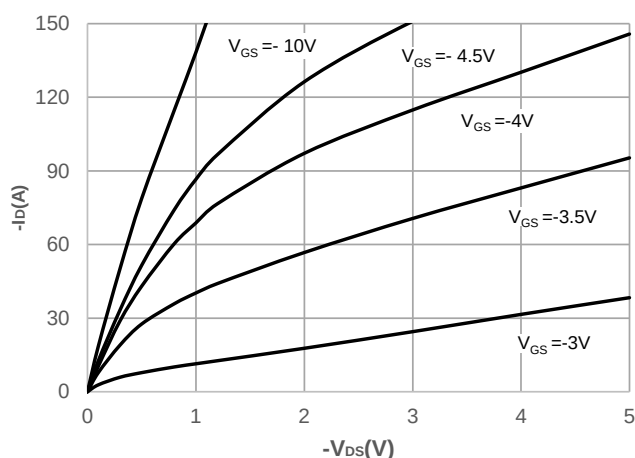


Figure 2: Typical Transfer Characteristics

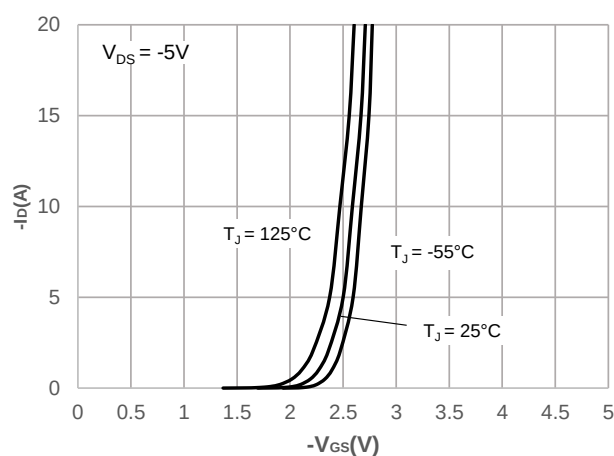


Figure 3: On-resistance vs. Drain Current

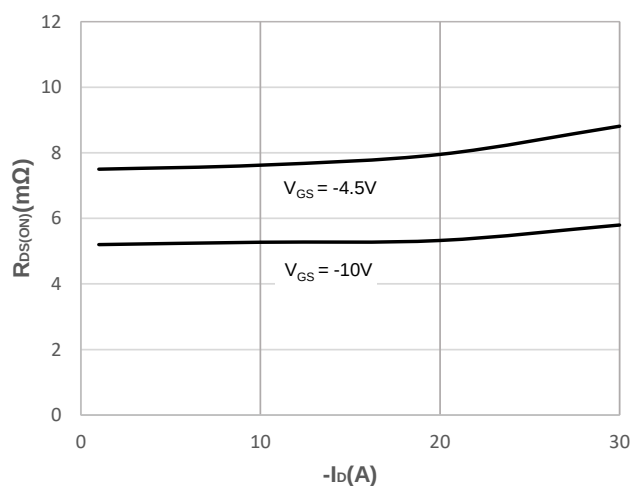


Figure 4: Body Diode Characteristics

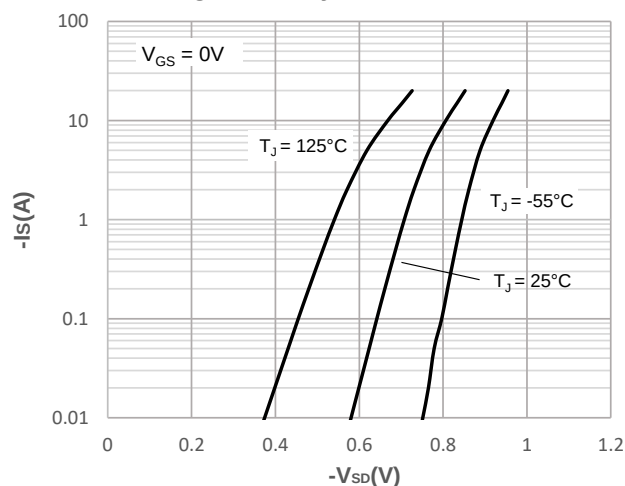


Figure 5: Gate Charge Characteristics

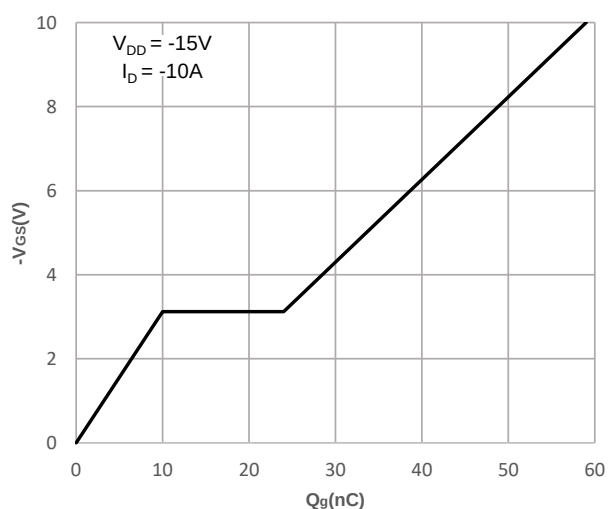
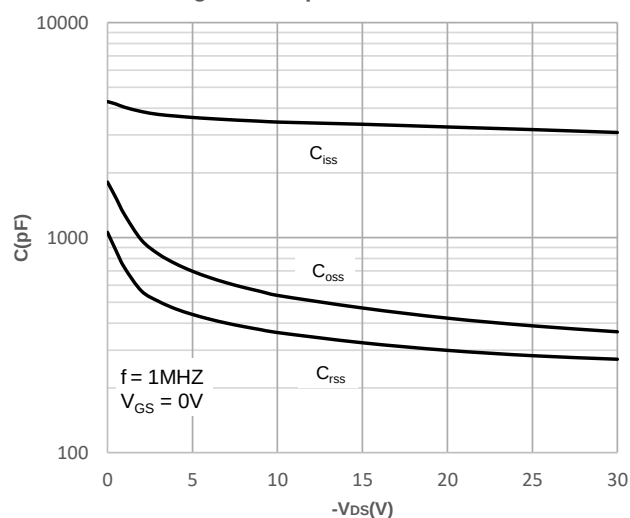


Figure 6: Capacitance Characteristics



Typical Characteristics

Figure 7: Normalized Breakdown voltage vs. Junction Temperature

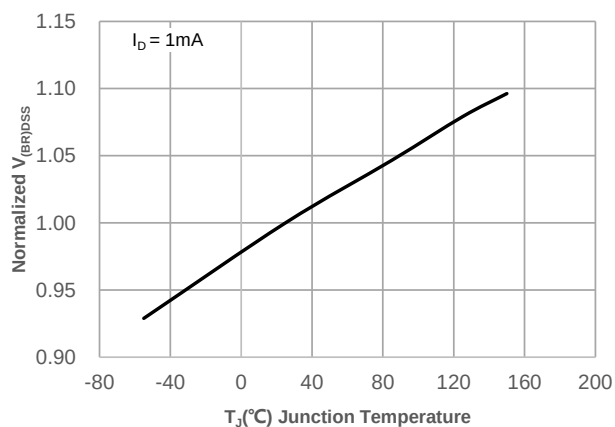


Figure 8: Normalized on Resistance vs. Junction Temperature

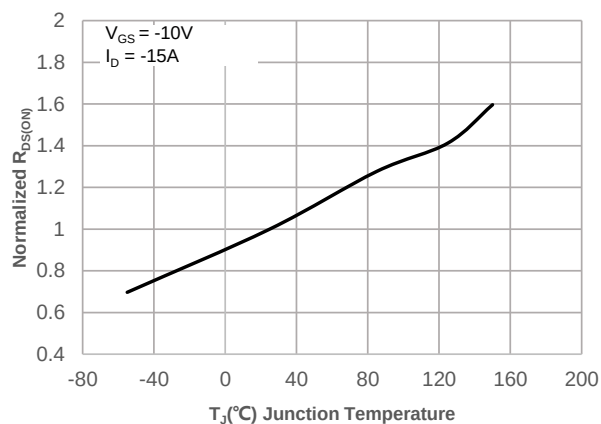


Figure 9: Maximum Safe Operating Area

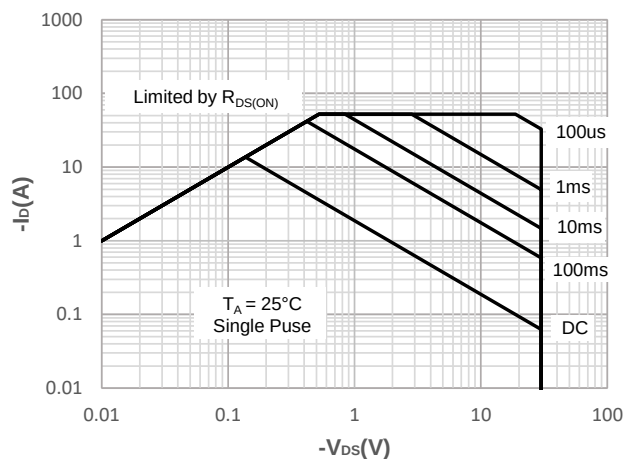


Figure 10: Maximum Continuous Driant Current vs. Ambient Temperature

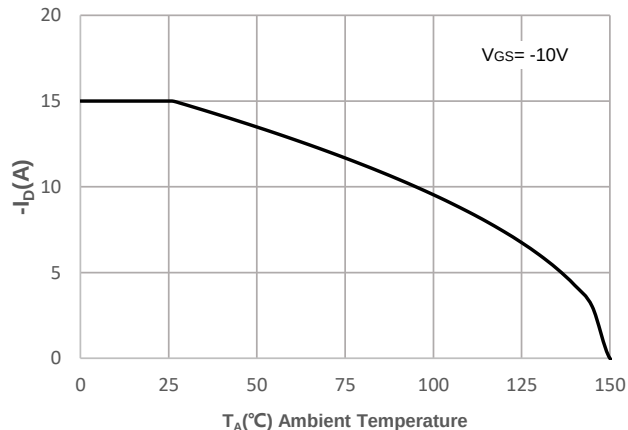


Figure 11: Normalized Maximum Transient Thermal Impedance

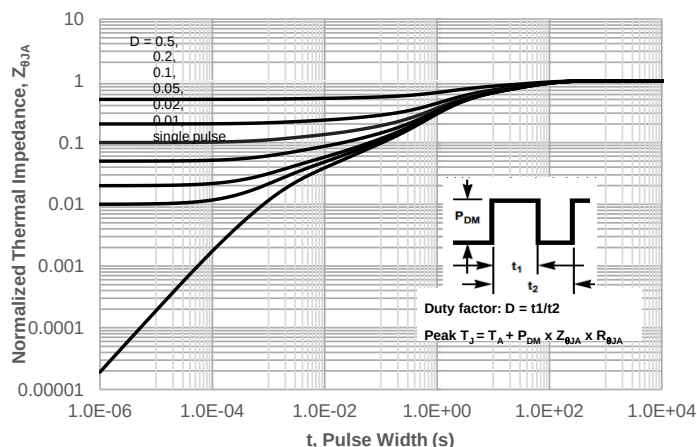
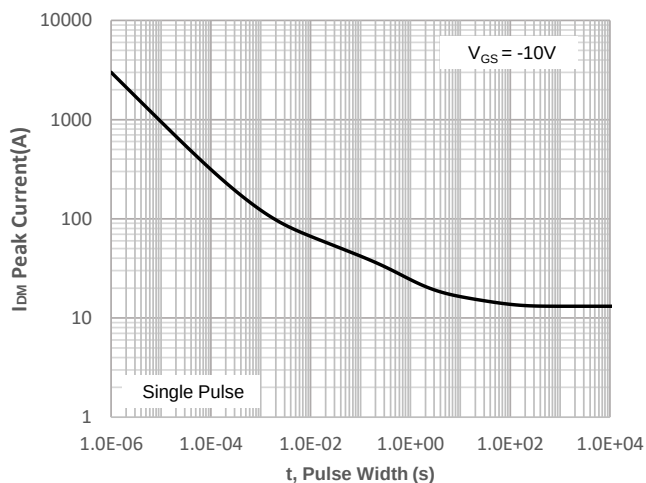
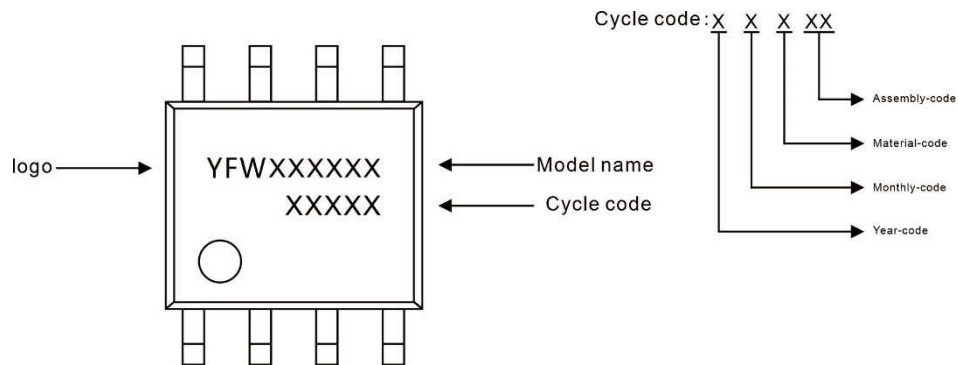


Figure 12: Peak Current Capacity



Marking Diagram



Ordering information

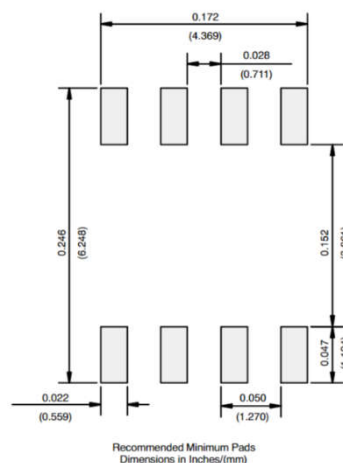
Package	Packing Description	Packing Quantity
SOP-8	Tape/Reel, 13" reel	3000PCS/Reel 30000PCS/Carton

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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