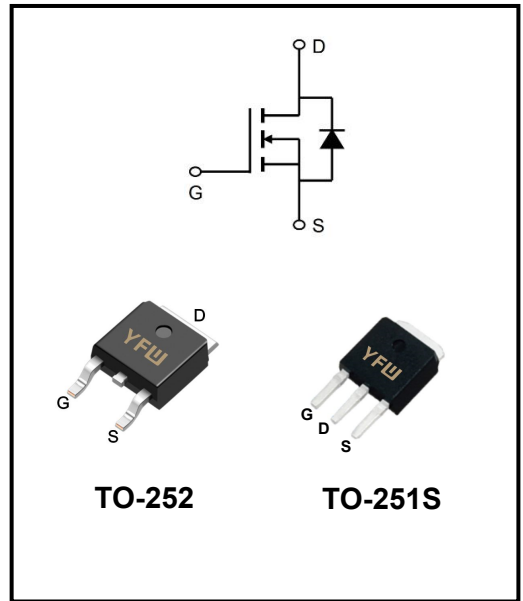


30V N-Channel Enhancement Mode MOSFET

MAIN CHARACTERISTICS

I_D	60A
V_{DS}	30V
$R_{DS(on)-typ}(@V_{GS}=10V)$	$< 8.8m\Omega$ (Typ: 5.8 m Ω)



FEATURES

Adopt 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

MECHANICAL DATA

- ◆ Case: TO-252/AD TO-251S/AMJ
- ◆ Mounting Position: Any
- ◆ Molded Plastic: UL Flammability Classification Rating 94V-0
- ◆ Lead free in compliance with EU RoHS 2011/65/EU directive
- ◆ Solder bath temperature 275°C maximum, 10s per JESD 22-B106

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
Continue Drain Current	I_D	60	A
Pulsed Drain Current (Note1)	I_{DM}	240	A
Total Power Dissipation	P_D	50	W
Single Pulse Avalanche Energy (Note1)	E_{AS}	100	mJ
Operating Junction Temperature Range	T_J	150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 to +150	$^\circ\text{C}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	37	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case	$R_{\theta JC}$	2.5	$^\circ\text{C/W}$

Note1: Pulse test: 300 μs pulse width, 2 % duty cycle

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}	30	-	-	V
Drain-Source Leakage Current	$V_{DS} = 30V, V_{GS} = 0 V$	I_{DSS}	-	-	1	μA
Gate 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	-	2	V
Drain-Source on-Resistance	$V_{GS}=10V, I_D=30A$	$R_{DS(ON)}$	-	5.8	8.8	m Ω
	$V_{GS} = 4.5 V, I_D = 20 A$		-	9	14	
Input Capacitance	$V_{DS}=15V$ $V_{GS}=0V$ $f=1MHz$	C_{iss}	-	1280	-	pF
Output Capacitance		C_{oss}	-	295	-	
Reverse Transfer Capacitance		C_{rss}	-	230	-	
Total Gate Charge	$V_{GS}=10V$ $V_{DS}=15V$ $I_D=30A$	Q_g	-	42	-	nC
Gate-Source Charge		Q_{gs}	-	9	-	
Gate-Drain Charge		Q_{gd}	-	10	-	
Turn-on delay time	$V_{DD}=15V$ $V_{GS}=10V$ $R_G=3\Omega$ $I_D=30A$	$t_{d(on)}$	-	9	-	ns
Rise Time		T_r	-	15	-	
Turn-Off Delay Time		$t_{d(OFF)}$	-	35	-	
Fall Time		t_f	-	10	-	
Maximun Body-Diode Continuous Current		I_S	-	-	60	A
Maximun Body-Diode Pulsed Current		I_{SM}	-	-	240	A
Drain-Source Diode Forward Voltage	$V_{GS}=0V, I_S=30A, T_J=25^{\circ}C$	V_{SD}	-	-	1.2	V
Body Diode Reverse Recovery Time	$I_S=20A, V_{GS} = 0 V,$ $dI / dt = 100 A/\mu s$	t_{rr}	-	11	-	ns
Body Diode Reverse Recovery Charge		Q_{rr}	-	2.5	-	nC

Note2:Pulse test: 300 μs pulse width, 2 % duty cycle

Ratings and Characteristic Curves

Figure 1: Output Characteristics

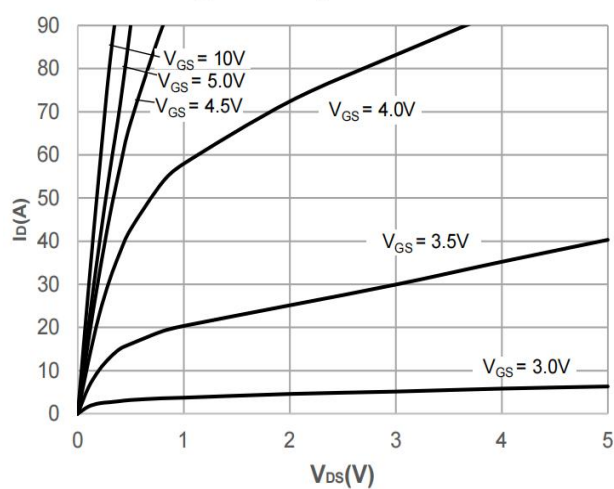


Figure 2: Typical Transfer Characteristics

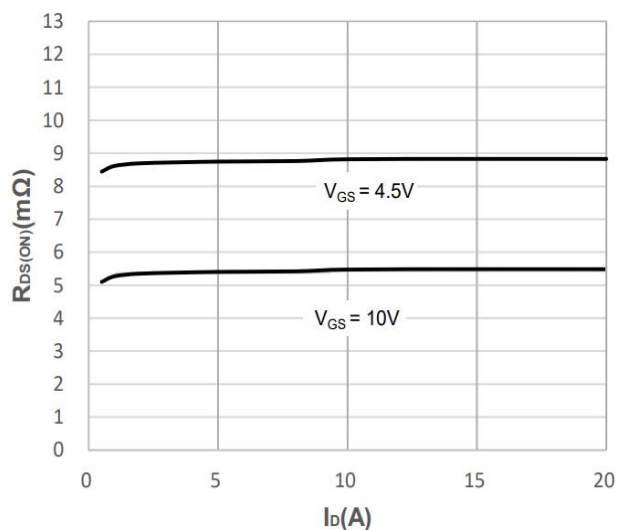
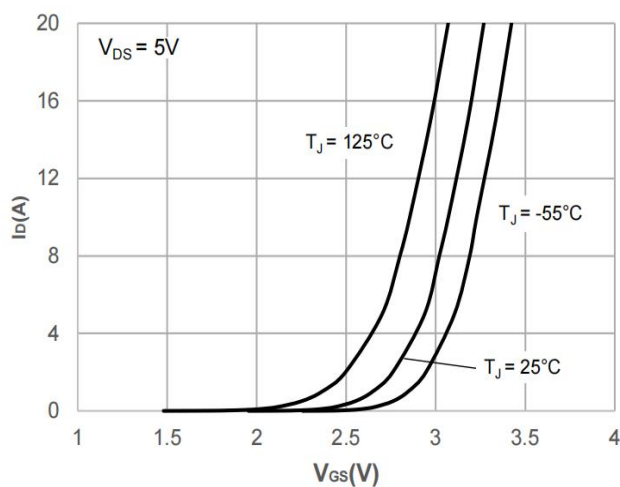


Figure 4: Body Diode Characteristics

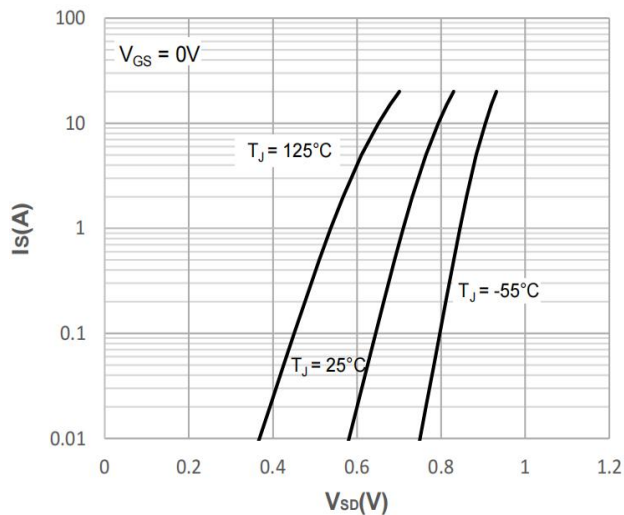


Figure 5: Gate Charge Characteristics

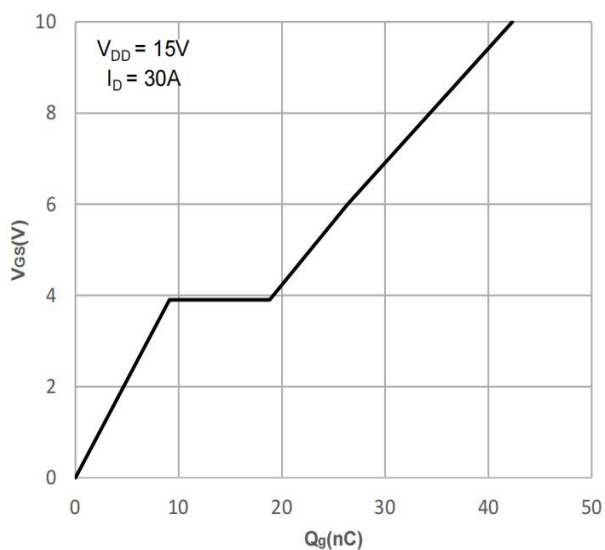
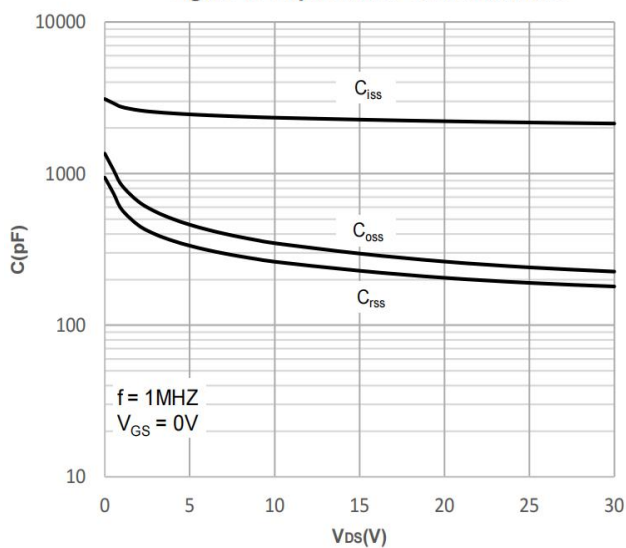


Figure 6: Capacitance Characteristics



Ratings and Characteristic Curves

Figure 7: Normalized Breakdown voltage vs. Junction Temperature

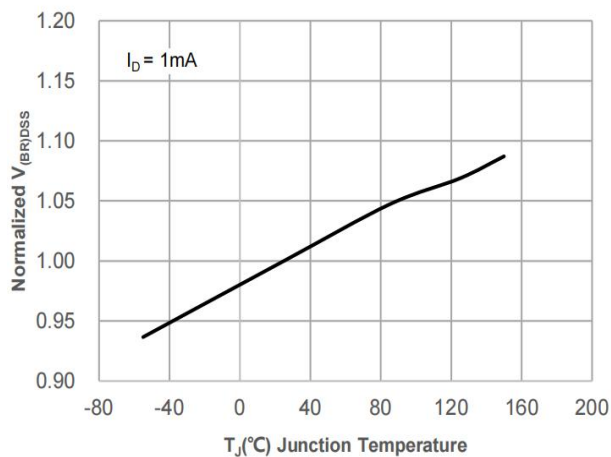


Figure 8: Normalized on Resistance vs. Junction Temperature

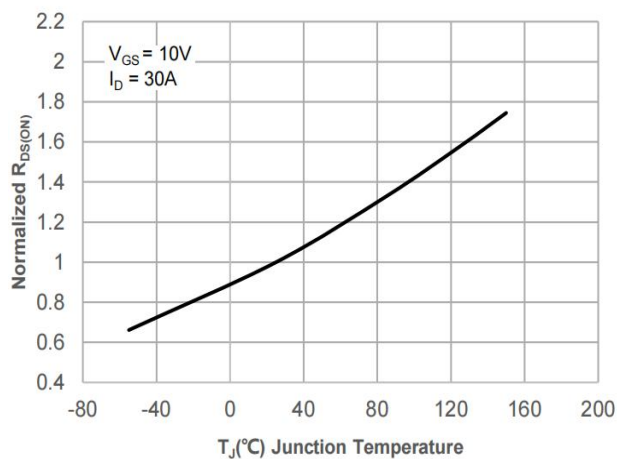


Figure 9: Maximum Safe Operating Area

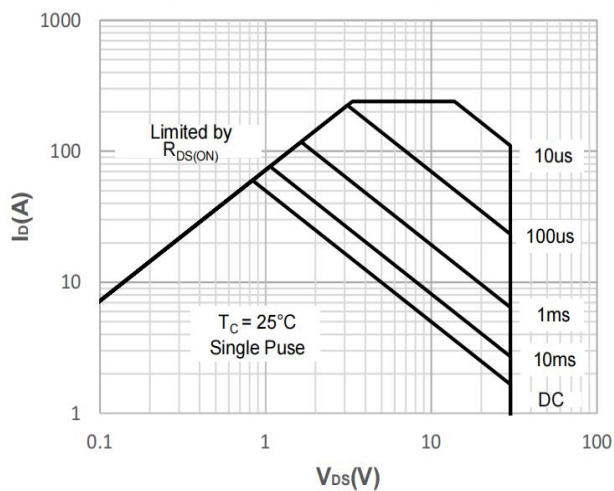


Figure 10: Maximum Continuous Drian Current vs. Case Temperature

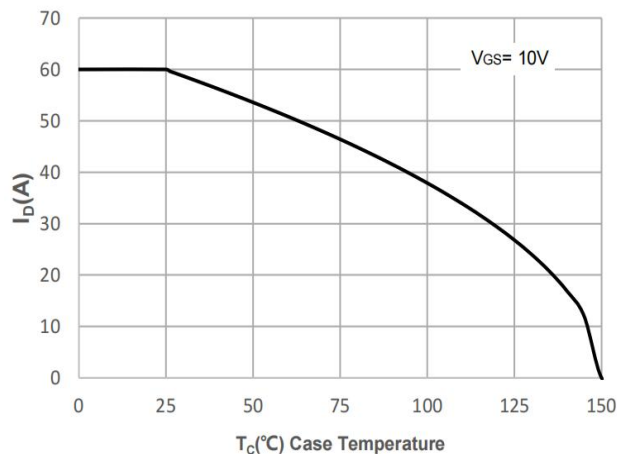


Figure 11: Normalized Maximum Transient Thermal Impedance

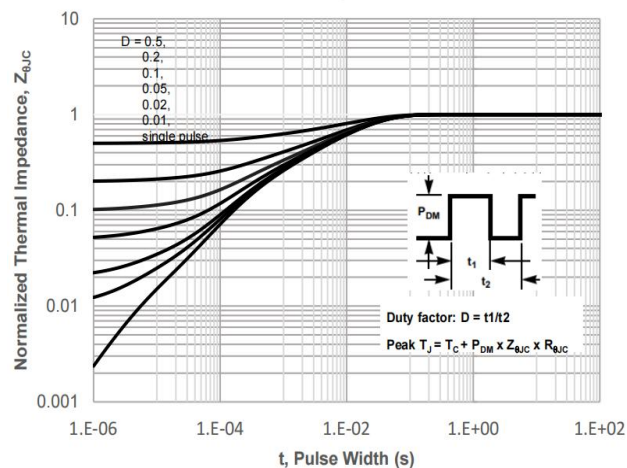
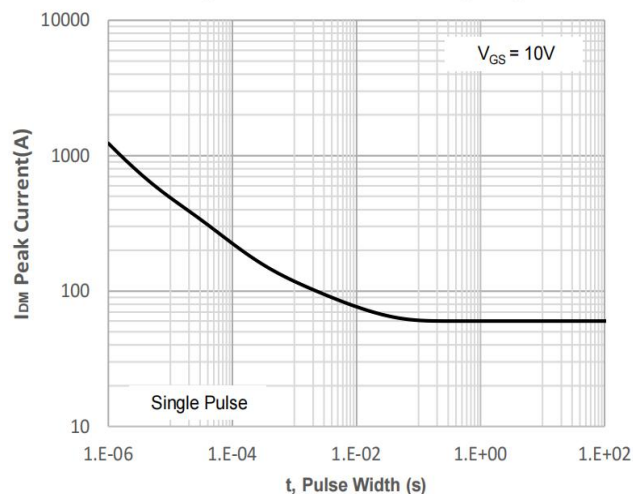
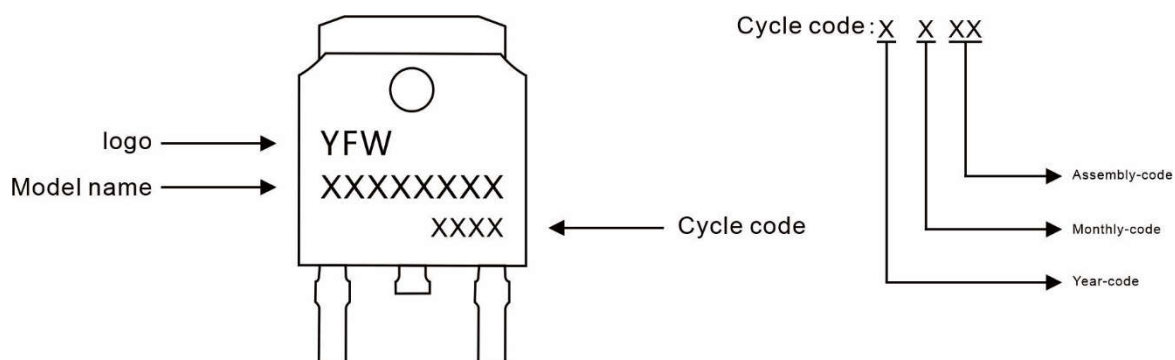


Figure 12: Peak Current Capacity



Marking Diagram



Ordering information

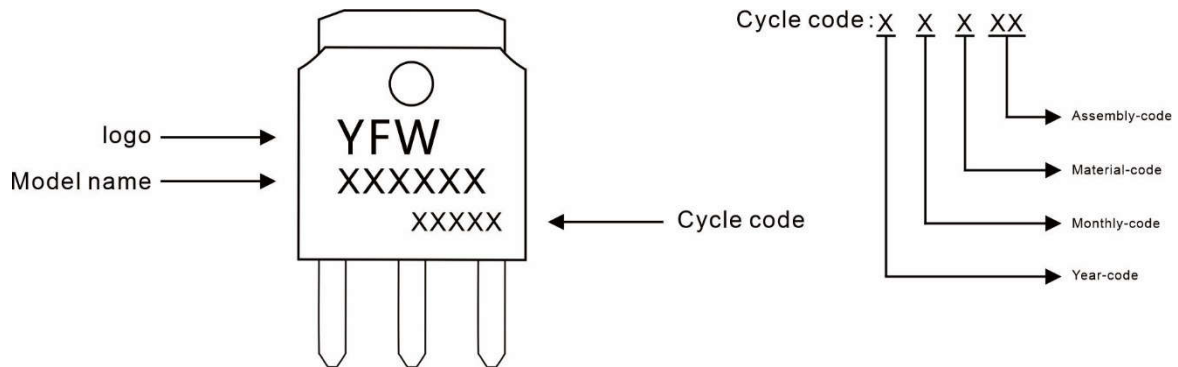
Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFW60N03AD	TO-252	0.011oz(0.32g)	2500pcs/reel	5000pcs/box 25000pcs/Carton

Package Dimensions

TO-252

Dim	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	2.20	2.50	0.087	0.098
A1	0.00	0.12	0.000	0.005
A2	2.20	2.40	0.087	0.094
B	0.95	1.55	0.037	0.061
b	0.50	0.80	0.020	0.031
b1	0.60	0.90	0.024	0.035
c	0.40	0.60	0.016	0.024
c1	0.40	0.60	0.016	0.024
D	6.35	6.65	0.250	0.262
D1	5.20	5.40	0.205	0.213
E	5.80	6.40	0.228	0.252
e	2.20	2.40	0.087	0.094
e1	4.40	4.80	0.173	0.189
L	10.00	11.00	0.393	0.433
L1	2.70	3.50	0.106	0.138
L2	1.40	1.80	0.055	0.071
L3	0.90	1.50	0.035	0.059

Marking Diagram



Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFW60N03AMJ	TO-251S	0.011oz(0.32g)	80pcs/tube	4000pcs/box 24000pcs/Carton

Package Dimensions

TO-251S

Dim	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	2.1	2.5	0.083	0.098
A1	6.3	6.9	0.248	0.271
A2	0.9	1.1	0.035	0.043
A3	TYP0.5		TYP0.019	
b	0.6	0.8	0.024	0.031
c	0.4	0.5	0.015	0.020
D	5.3	5.5	0.209	0.217
D2	3.65	4.05	0.144	0.159
E	5.8	6.4	0.228	0.252
E2	0.9	1.4	0.035	0.055
e	TYP2.29		TYP0.090	
e1	TYP4.58		TYP0.180	
L	3.7	4.3	0.146	0.169

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