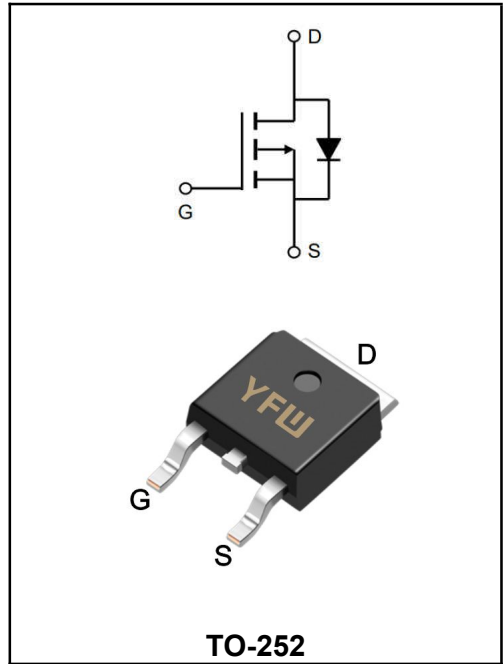


-20V P-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	-60A
V_{DSS}	-20V
R_{DS(on)-typ}(@V_{GS}=-4.5V)	< 12mΩ (Type:8 mΩ)



Application

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

Maximum Ratings at T_c=25°C unless otherwise specified

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V _{DS}	-20	V
Gate - Source Voltage	V _{GS}	±12	V
Continuous Drain Current, V _{GS} @ -4.5V ¹ @T _c =25°C	I _D	-60	A
Continuous Drain Current, V _{GS} @ -4.5V ¹ @T _c =70°C	I _D	-48	A
Pulsed Drain Current ²	I _{DM}	-200	A
Total Power Dissipation ³ @T _c =25°C	P _D	60	W
Total Power Dissipation ³ @T _c =70°C	P _D	48	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}	75	°C/W
Thermal Resistance Junction-Ambient ¹ (t ≤ 10s)	R _{θJA}	40	°C/W
Thermal Resistance Junction to Case ¹	R _{θJC}	3.6	°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}	-20	-22	-	V
BV_{DSS} Temperature Coefficient	Reference to 25°C, $I_D=-1mA$	$\Delta BV_{DSS}/\Delta T_J$	-	-0.012	-	V/°C
Static Drain-Source On-Resistance ²	$V_{GS}=-4.5V, I_D=-10A$	$R_{DS(ON)}$	-	8	12	mΩ
	$V_{GS}=-2.5V, I_D=-5.0A$		-	11	16	
Gate -Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	$V_{GS(th)}$	-0.4	-0.65	-1.0	V
$V_{GS(th)}$ Temperature Coefficient		$\Delta V_{GS(th)}$	-	2.94	-	mV/°C
Drain-Source Leakage Current	$V_{DS}=-20V, V_{GS}=0V, T_J=25^\circ C$	I_{DSS}	-	-	1	μA
Gate -Source Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$	I_{GSS}	-	-	±100	nA
Forward Transconductance	$V_{DS}=-10V, I_D=-10A$	g_{fs}	12	-	-	S
Total Gate Charge(-4.5V)	$V_{DS}=-10V$ $V_{GS}=-4.5V$ $I_D=-10A$	Q_g	-	63	-	nC
Gate-Source Charge		Q_{gs}	-	9.1	-	
Gate-Drain Charge		Q_{gd}	-	13	-	
Turn-on delay time	$V_{DD}=-10V$ $V_{GS}=-4.5V$ $I_D=-1A$ $R_G=6.0\Omega$	$t_{d(on)}$	-	10	-	ns
Rise Time		T_r	-	15	-	
Turn-Off Delay Time		$t_{d(OFF)}$	-	110	-	
Fall Time		t_f	-	70	-	
Input Capacitance	$V_{DS}=-15V$ $V_{GS}=0V$ $f=1MHz$	C_{iss}	-	1600	-	pF
Output Capacitance		C_{oss}	-	350	-	
Reverse Transfer Capacitance		C_{rss}	-	300	-	
Continuous Source Current ^{1,4}	$V_G=V_D=0V, \text{Force Current}$	I_S	-	-	-50	A
Diode Forward Voltage ²	$V_{GS}=0V, I_S=-15A, T_J=25^\circ C$	V_{SD}	-	-	-1.2	V

Note :

- 1、 The data tested by surface mounted on a 1 inch 2 FR-4 board with 2OZ copper.
- 2、 The data tested by pulsed , pulse width $\cong 300\mu s$, duty cycle $\cong 2\%$
- 3、 The EAS data shows Max. rating . The test condition is $V_{DD}=-16V, V_{GS}=-10V, L=0.1mH, I_{AS}=12A$
- 4、 The power dissipation is limited by 150°C junction temperature
- 5、 The data is theoretically the same as I D and I DM , in real applications , should be limited by total power dissipation.

Ratings and Characteristic Curves

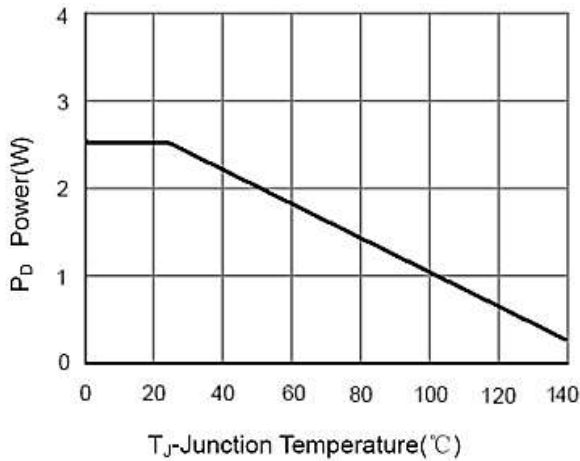


Figure 1: Power Dissipation

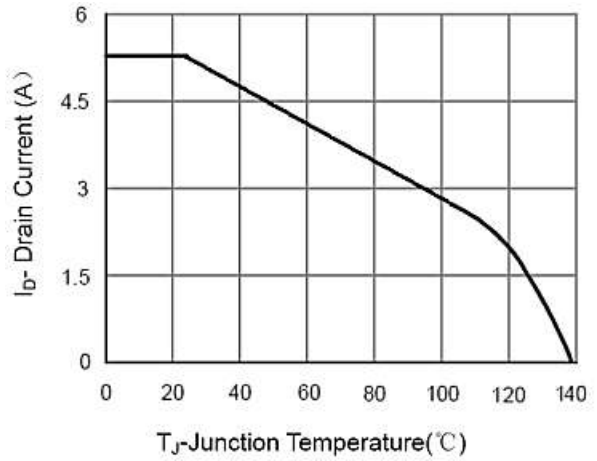


Figure 2: Drain Current

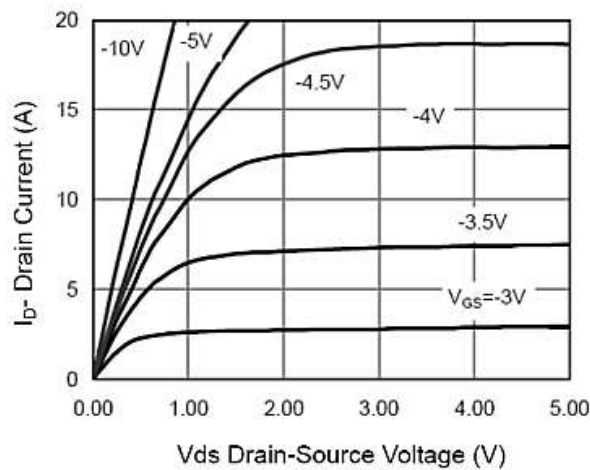


Figure 3: Output Characteristics

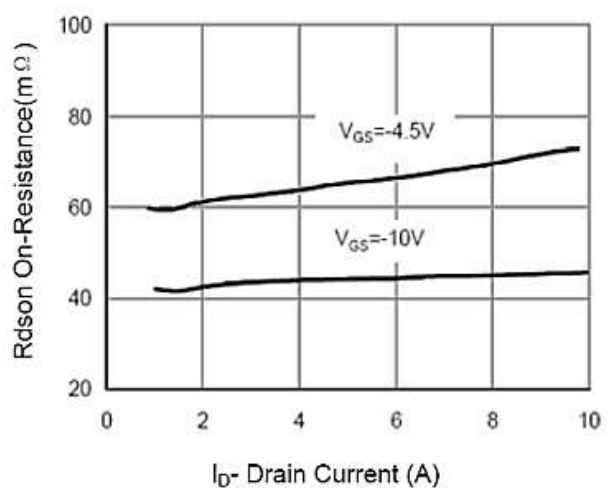


Figure 4: Drain-Source On-Resistance

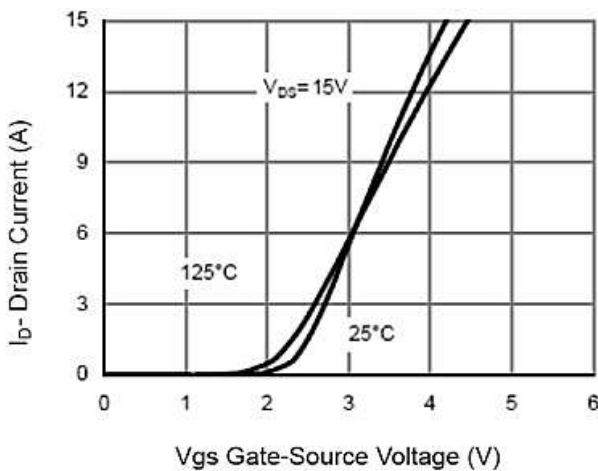


Figure 5: Transfer Characteristics

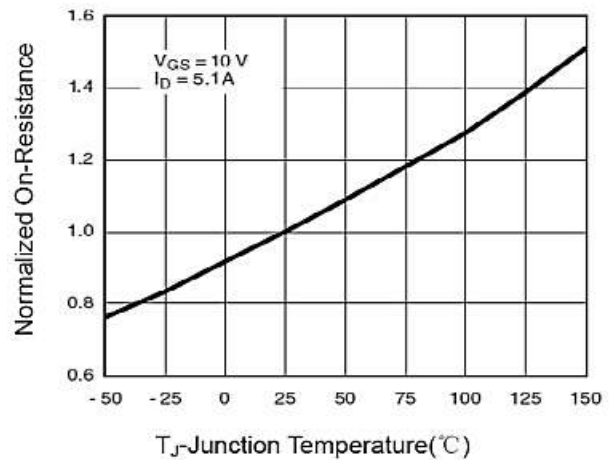


Figure 6: Drain-Source On-Resistance

Ratings and Characteristic Curves

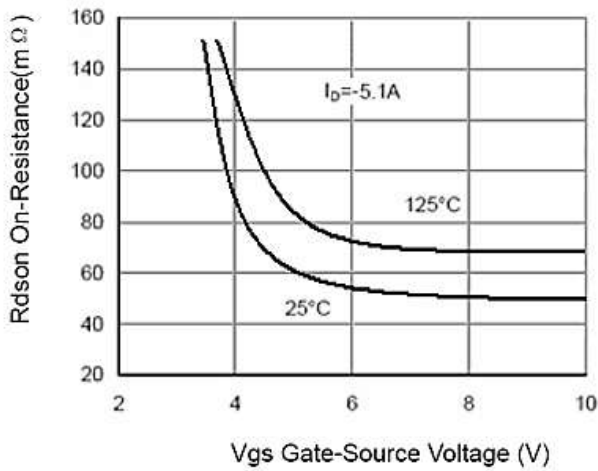


Figure 7: Rdson vs Vgs

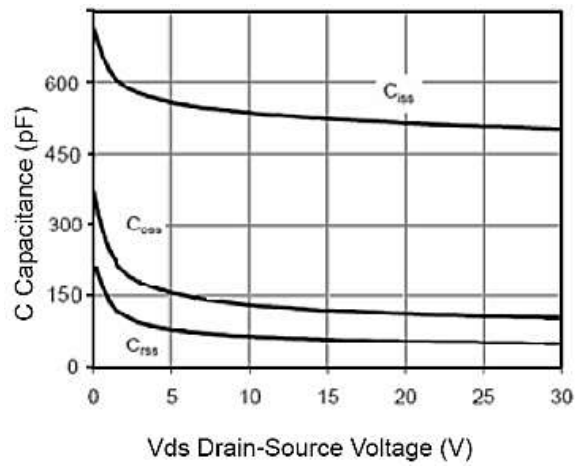


Figure 8: Capacitance vs Vds

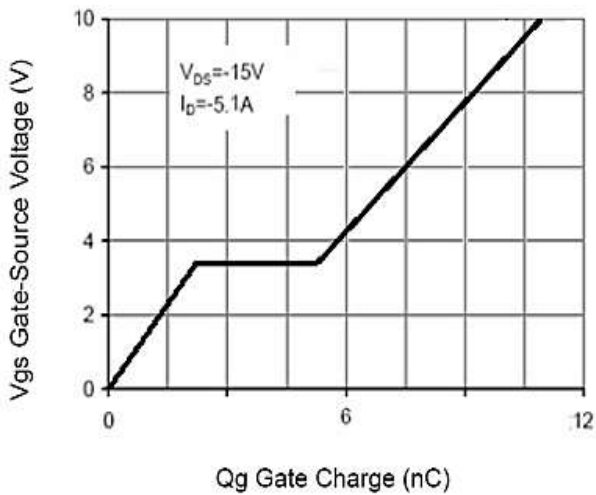


Figure 9: Gate Charge

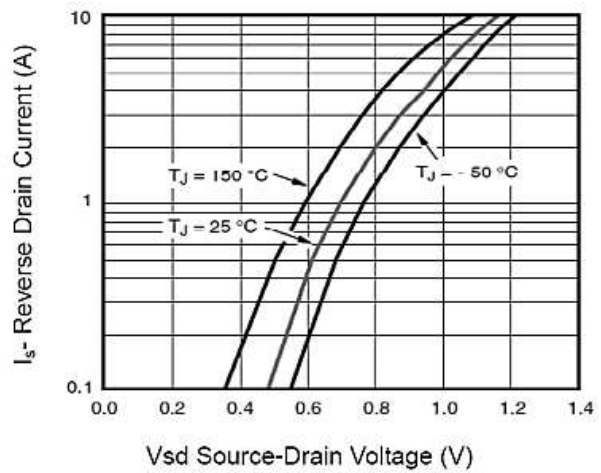


Figure 10: Source-Drain Diode Forward

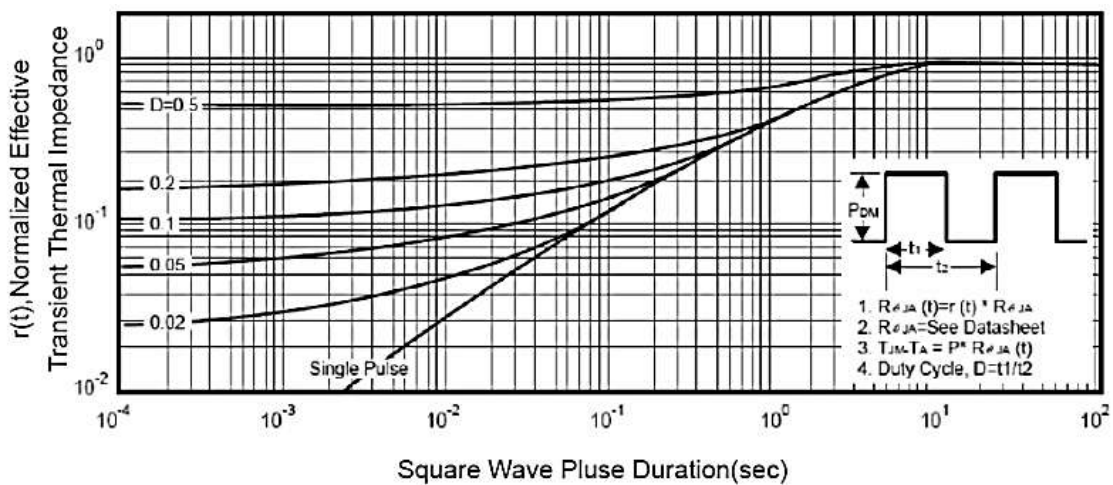
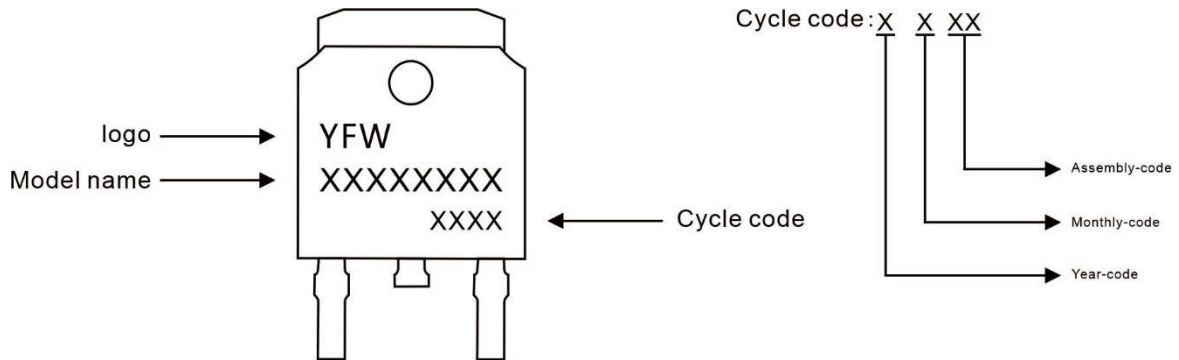


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

Marking Diagram



Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFW60P02AD	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	1.20	1.60	0.047	0.063
b	0.50	0.70	0.020	0.028
b1	0.70	0.90	0.028	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	5.40	5.70	0.213	0.224
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	3.10	0.106	0.122
L2	1.40	1.80	0.055	0.071
L3	0.90	1.50	0.035	0.059

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