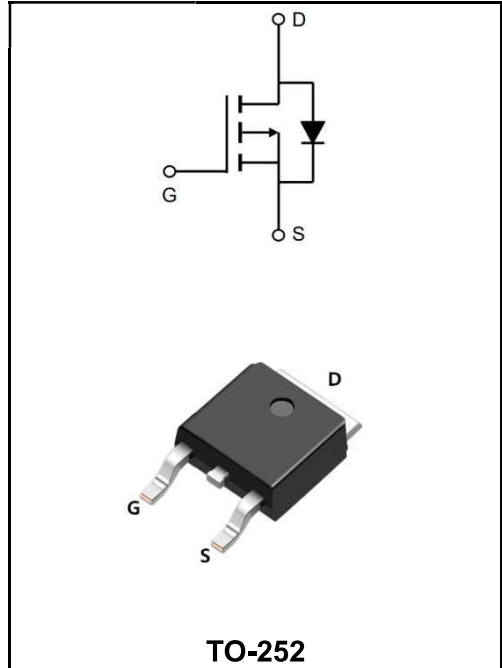


-20V P-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	-40A
V_{DSS}	-20V
R_{DS(on)-typ}(@V_{GS}=-4.5V)	< 20mΩ (Type:12 mΩ)



Application

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

Product Specification Classification

Part Number	Package	Marking	Pack
YFW40P02AD	TO-252	YFW 40P02AD XXXXX	2500PCS/Tape

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	-40	A
Continuous Drain Current, V _{GS} @ -4.5V ¹ @T _C =70°C	I_D	-35	A
Pulsed Drain Current ²	I_{DM}	-160	A
Total Power Dissipation ³ @T _C =25°C	P_D	2.5	W
Total Power Dissipation ³ @T _C =70°C	P_D	1.6	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}	65.5	°C/W
Thermal Resistance Junction to Case ¹	R_{θJC}	24	°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	-23	-	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	$V_{GS}=-4.5V, I_D=-20A$	$R_{DS(ON)}$	-	12	20	mΩ
	$V_{GS}=-2.5V, I_D=-10A$		-	22	28	
Gate -Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	$V_{GS(th)}$	-0.5	-0.6	-1.2	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
Total Gate Charge(-4.5V)	$V_{DS}=-10V$ $V_{GS}=-4.5V$ $I_D=-6A$	Q_g	-	15.3	-	nC
Gate-Source Charge		Q_{gs}	-	2.2	-	
Gate-Drain Charge		Q_{gd}	-	4.4	-	
Turn-on delay time	$V_{DD}=-10V$ $V_{GS}=-4.5V$ $I_D=-10A$ $R_G=3.3\Omega$	$t_{d(on)}$	-	10	-	ns
Rise Time		T_r	-	31	-	
Turn-Off Delay Time		$t_{d(OFF)}$	-	28	-	
Fall Time		t_f	-	8	-	
Input Capacitance	$V_{DS}=-10V$ $V_{GS}=0V$ $f=1MHz$	C_{iss}	-	2000	-	pF
Output Capacitance		C_{oss}	-	242	-	
Reverse Transfer Capacitance		C_{rss}	-	231	-	
Continuous Source Current ^{1,4}	$V_G=V_D=0V, \text{ Force Current}$	I_S	-	-	-20	A
Pulsed Source Current ^{2,4}		I_{SM}	-	-	-48	A
Diode Forward Voltage ²	$V_{GS}=0V, I_S=-1A, T_J=25^\circ C$	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 power dissipation is limited by 150°C junction temperature
- 4、 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

Typical Characteristics

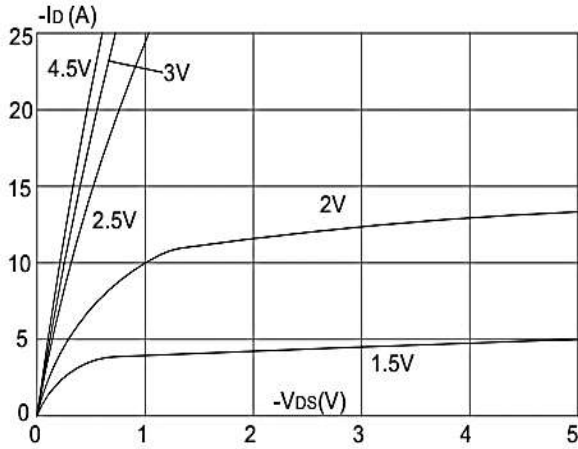


Figure1: Output Characteristics

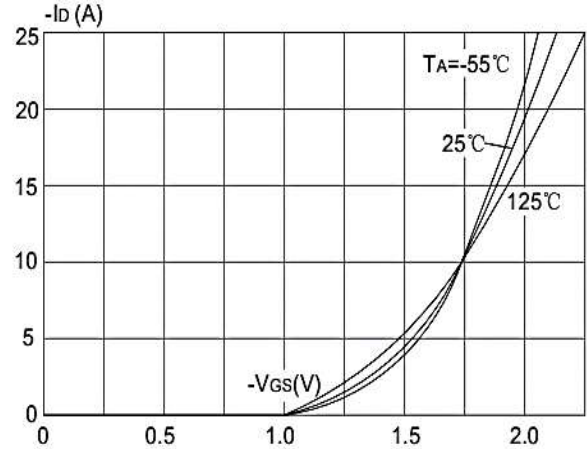


Figure 2: Typical Transfer Characteristics

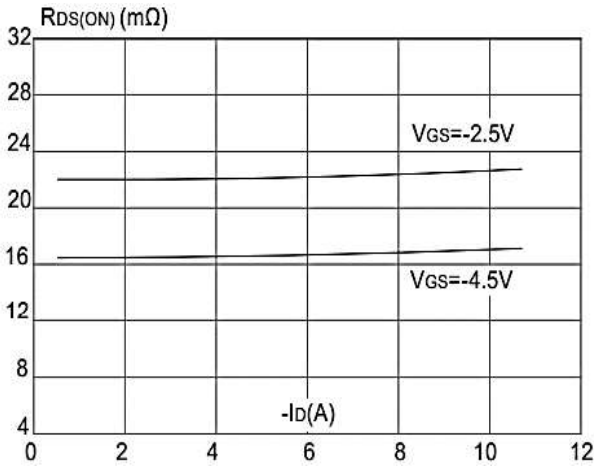


Figure 3: On-resistance vs. Drain Current

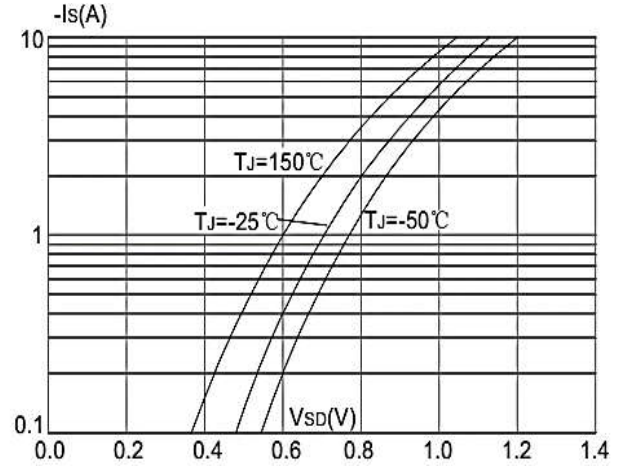


Figure 4: Body Diode Characteristics

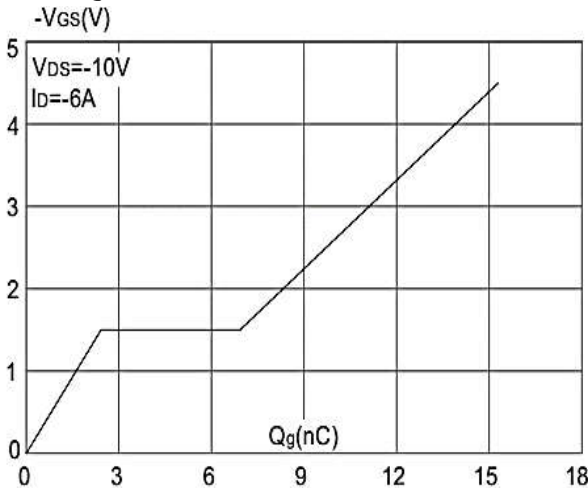


Figure 5: Gate Charge Characteristics

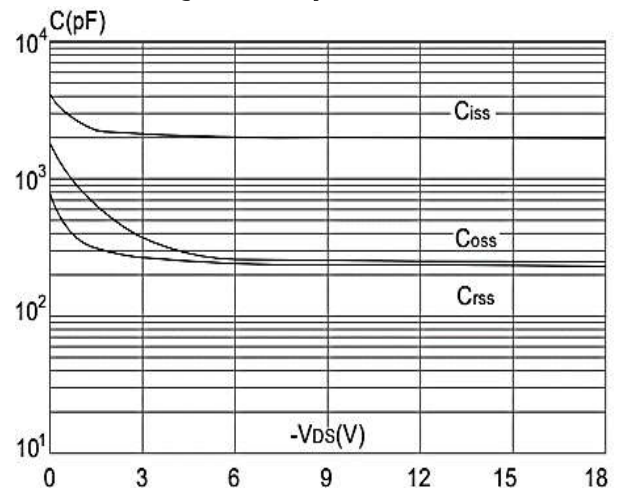


Figure 6: Capacitance Characteristics

Ratings and Characteristic Curves

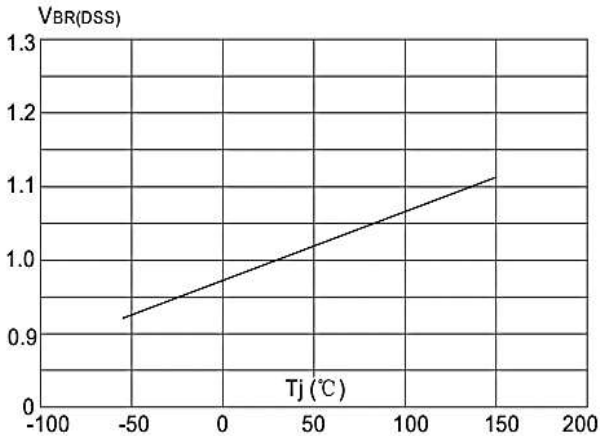


Figure 7: Normalized Breakdown Voltage vs Junction Temperature

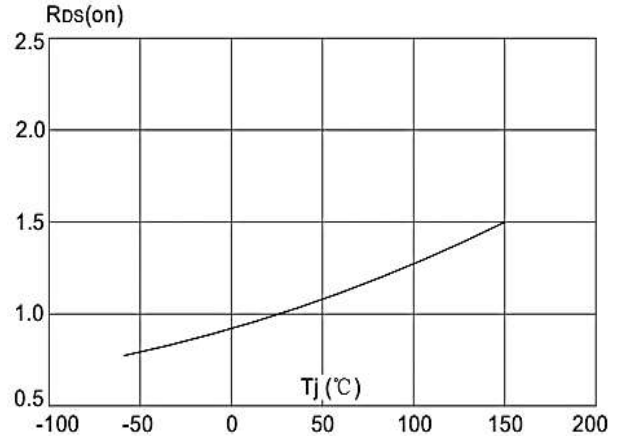


Figure 8: Normalized on Resistance vs. Junction Temperature

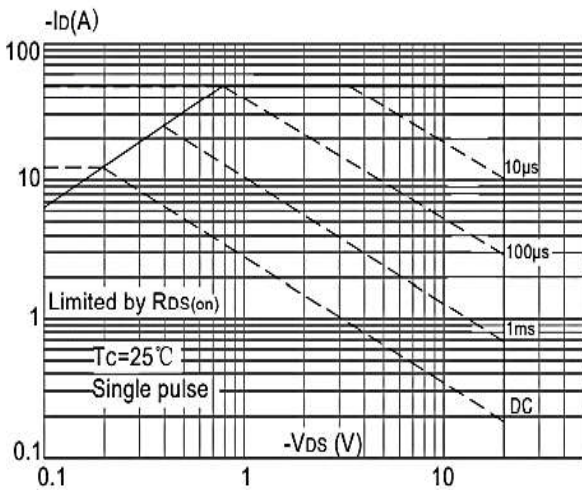


Figure 9: Maximum Safe Operating Area

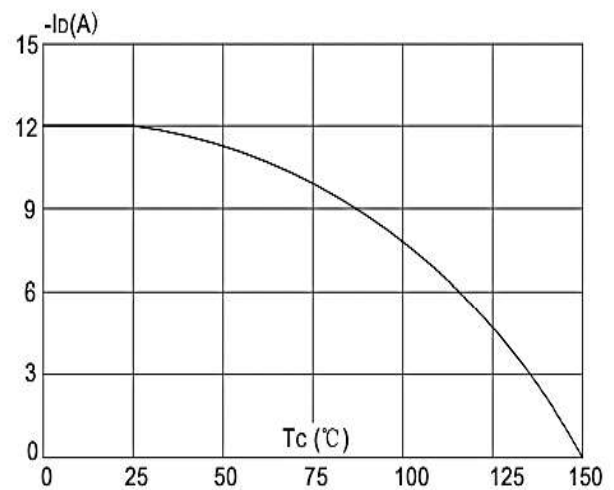


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

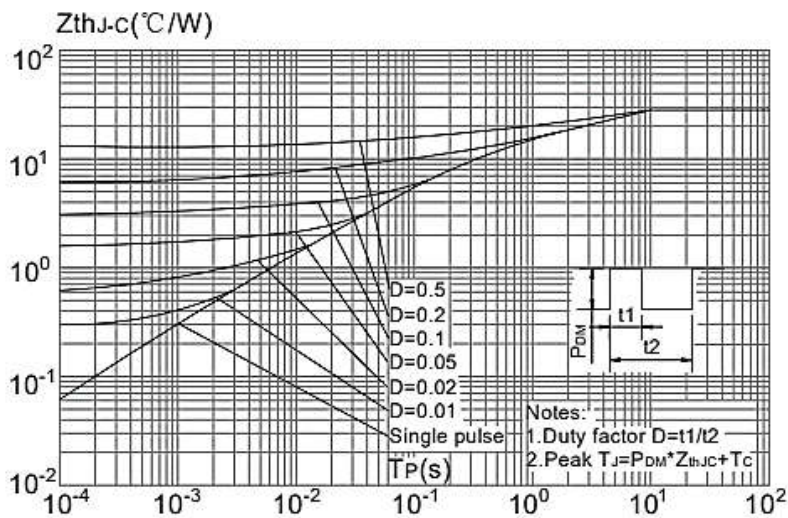


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambien

Package Outline Dimensions Millimeters

TO-252

Dim.	Min.	Typ.	Max.
A	2.10	-	2.50
A2	0	-	0.10
B	0.66	-	0.86
B2	5.18	-	5.48
C	0.40	-	0.60
C2	0.44	-	0.58
D	5.90	-	6.30
D1	5.30REF		
E	6.40	-	6.80
E1	4.63	-	-
G	4.47	-	4.67
H	9.50	-	10.70
L	1.09	-	1.21
L2	1.35	-	1.65
V1	-	7°	-
V2	0°	-	6°
All Dimensions in millimeter			

