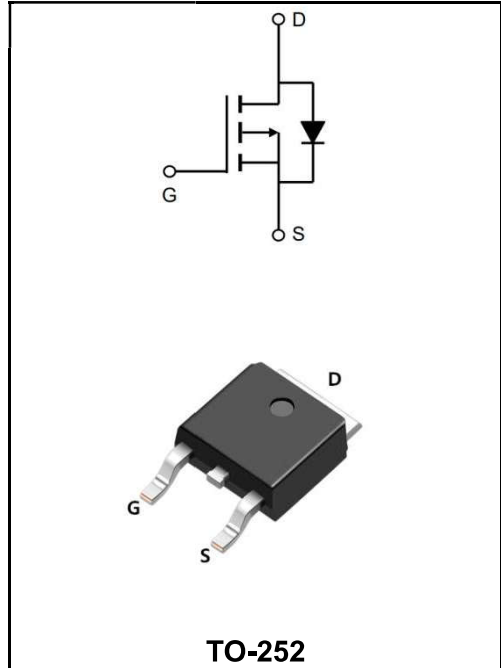


**-200V P-CHANNEL ENHANCEMENT MODE MOSFET**

**MAIN CHARACTERISTICS**

<b>I<sub>D</sub></b>	-9A
<b>V<sub>DSS</sub></b>	-200V
<b>R<sub>DS(on)-typ(@V<sub>GS</sub>=-10V)</sub></b>	< 0.75Ω ( <b>Type:0.625 Ω</b> )



**Application**

- ◆ Power amplifier
- ◆ motor drive



**Product Specification Classification**

Part Number	Package	Marking	Pack
YFW9P20AD	TO-252	YFW 9P20AD XXXXX	2500PCS/Tape

**Maximum Ratings at T<sub>c</sub>=25°C unless otherwise specified**

Characteristics	Symbols	Value	Units
Drain-Source Voltage	<b>V<sub>DS</sub></b>	-200	<b>V</b>
Gate - Source Voltage	<b>V<sub>GS</sub></b>	±20	<b>V</b>
Continuous Drain Current T <sub>C</sub> =25°C	<b>I<sub>D</sub></b>	-8.7	<b>A</b>
Continuous Drain Current T <sub>C</sub> =100°C		-3.6	<b>A</b>
Pulsed Drain Current <sup>a</sup>	<b>I<sub>DM</sub></b>	-22.8	<b>A</b>
Single Pulse Avalanche Energy <sup>b</sup>	<b>E<sub>AS</sub></b>	570	<b>mJ</b>
Repetitive Avalanche Current <sup>a</sup>	<b>I<sub>AR</sub></b>	-8.7	<b>A</b>
Repetitive Avalanche Energy <sup>a</sup>	<b>E<sub>AR</sub></b>	5.5	<b>mJ</b>
Maximum Power Dissipation T <sub>C</sub> = 25 °C	<b>P<sub>D</sub></b>	55	<b>W</b>
Maximum Power Dissipation (PCB Mount) <sup>e</sup> T <sub>A</sub> = 25 °C		2.5	<b>W</b>
Peak Diode Recovery dV/dt <sup>c</sup>	<b>dV/dt</b>	-5.5	<b>V/ns</b>
Operating Junction and Storage Temperature Range	<b>T<sub>J</sub>, T<sub>STG</sub></b>	-55 to +150	<b>°C</b>
Maximum Junction-to-Ambient	<b>R<sub>θJA</sub></b>	110	<b>°C/W</b>
Maximum Junction-to-Ambient (PCB Mount) <sup>a</sup>	<b>R<sub>θJA</sub></b>	50	<b>°C/W</b>
Maximum Junction-to-Case (Drain)	<b>R<sub>θJC</sub></b>	2.2	<b>°C/W</b>

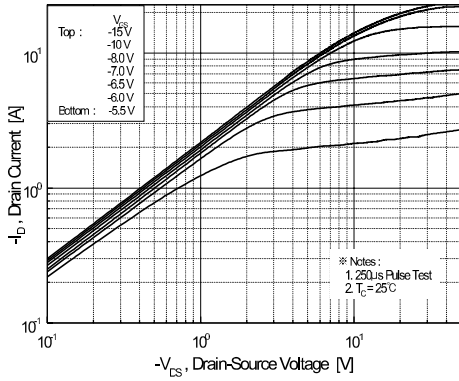
**Maximum Ratings at Tc=25°C unless otherwise specified**

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	$V_{DS}$	-200	-	-	V
$V_{DS}$ Temperature Coefficient	Reference to 25°C, $I_D=-1mA$	$\Delta V_{DS}/T_J$	-	-0.1	-	V/°C
Gate-Source Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	$V_{GS(th)}$	-2.0	-3.5	-4.0	V
Drain-Source On-State Resistance	$V_{GS}=-10V, I_D=-4A^b$	$R_{DS(ON)}$	-	0.625	0.75	Ω
Gate –Source Leakage	$V_{GS}=\pm 20V$	$I_{GSS}$	-	-	±100	nA
Zero Gate Voltage Drain Current	$V_{DS}=-200V, V_{GS}=0V$	$I_{DSS}$	-	-	-100	μA
	$V_{DS}=-160V, V_{GS}=0V, T_J=125^\circ C$		-	-	-500	
Forward Transconductance	$V_{DS}=-50V, I_D=-2.2A$	$g_{fs}$	1.1	-	-	S
Input Capacitance	$V_{GS}=0V$ $V_{DS}=-25V$ $f=1MHz$	$C_{iss}$	-	590	770	pF
Output Capacitance		$C_{oss}$	-	140	180	
Reverse Transfer Capacitance		$C_{rss}$	-	25	35	
Total Gate Charge	$I_D=-7.3A$ $V_{DS}=-160V$ $V_{GS}=-10V$	$Q_g$	-	-	20	nC
Gate-Source Charge		$Q_{gs}$	-	-	3.3	
Gate-Drain Charge		$Q_{gd}$	-	-	11	
Turn-on delay time	$V_{DD}=-100V$ $I_D=-7.3A$ $R_G=18\Omega$ $R_D=25\Omega$	$t_{d(on)}$	-	8.8	-	ns
Rise Time		$T_r$	-	27	-	
Turn-Off Delay Time		$t_{d(OFF)}$	-	7.3	-	
Fall Time		$t_f$	-	19	-	
Continuous Source-Drain Diode Current	MOSFET symbol showing the integral reversep - n junction diode	$I_S$	-	-	-3.6	A
Pulsed Diode Forward Current <sup>a</sup>		$I_{SM}$	-	-	-14	A
Body Diode Voltage	$T_J = 25^\circ C, I_S = -5.7A,$ $V_{GS} = 0V^b$	$V_{SD}$	-	-	-6.3	V
Body Diode Reverse Recovery Time	$T_J = 25^\circ C, I_F = -7.3A,$ $di/dt = 100A/\mu s^b$	$t_{rr}$	-	150	300	ns
Body Diode Reverse Recovery Charge		$Q_{rr}$	-	0.97	2.0	μC
Forward Turn-On Time	Intrinsic turn-on time is negligible (turn-on is dominated by LS and LD)	$t_{on}$	-	-	-	-

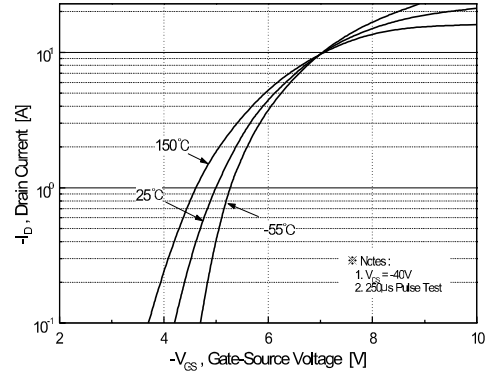
**Notes**

1. Repetitive Rating : Pulse width limited by maximum junction temperature
2. L=26.3mH, I<sub>AS</sub> = -5.7A, V<sub>DD</sub> = -50V, R<sub>c</sub> = 25 2, Starting T<sub>j</sub> = 25°C
3. I<sub>sD</sub> ≤ -7.3A, di/dt ≤ 300A/μs, V<sub>DD</sub> ≤ BVD<sub>ss</sub>, Starting T<sub>j</sub> = 25°C
4. Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%
5. Essentially independent of operating temperature

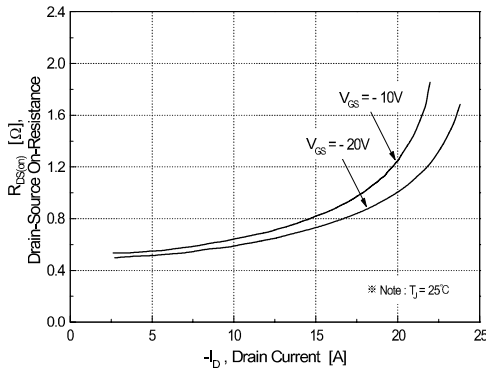
**Ratings and Characteristic Curves**



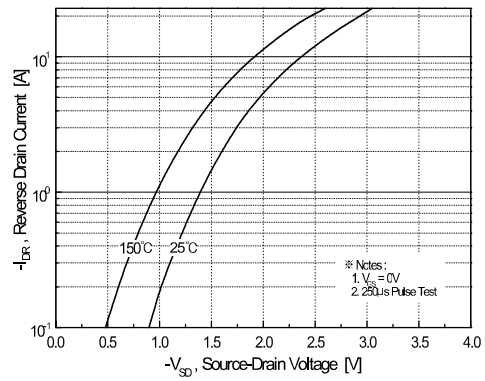
**Figure 1. On-Region Characteristics**



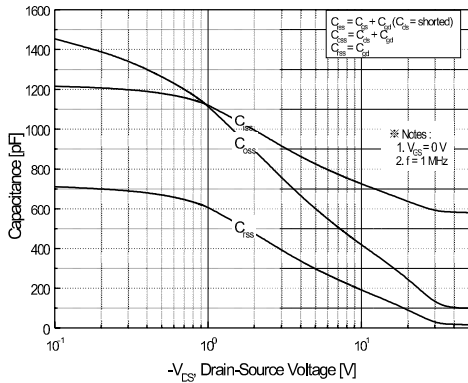
**Figure 2. Transfer Characteristics**



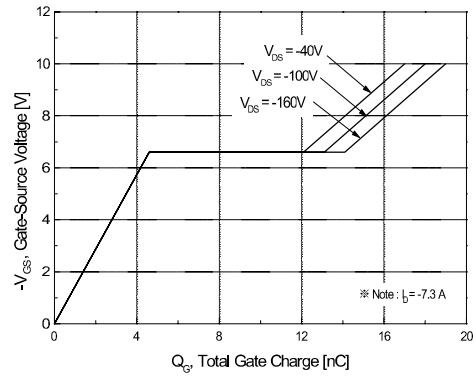
**Figure 3. On-Resistance Variation vs. Drain Current and Gate Voltage**



**Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperature**

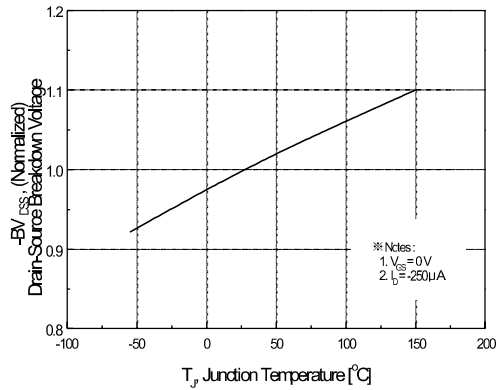


**Figure 5. Capacitance Characteristics**

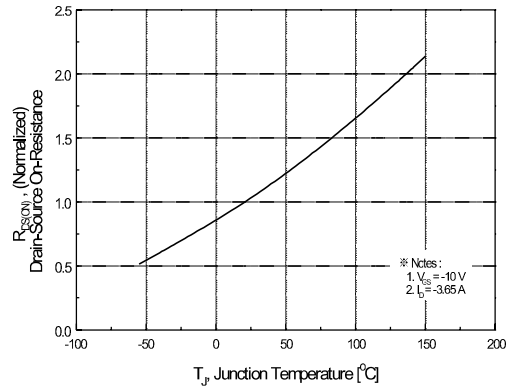


**Figure 6. Gate Charge Characteristics**

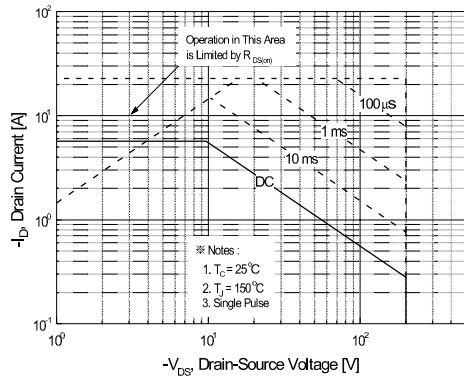
**Ratings and Characteristic Curves**



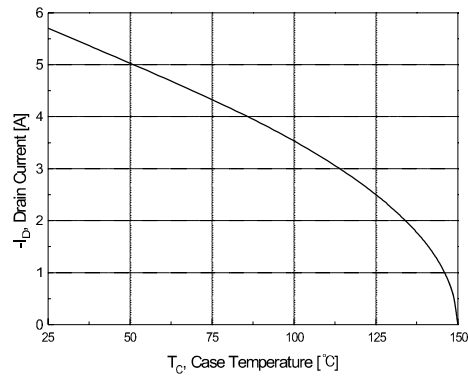
**Figure 7. Breakdown Voltage Variation vs. Temperature**



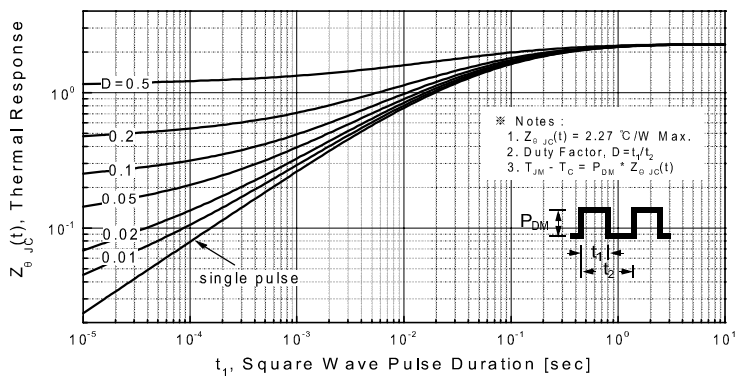
**Figure 8. On-Resistance Variation vs. Temperature**



**Figure 9. Maximum Safe Operating Area**



**Figure 10. Maximum Drain Current vs. Case Temperature**



**Figure 11. Transient Thermal Response Curve**

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			

