



-12Amps, -60 Volts P-CHANNEL MOSFET

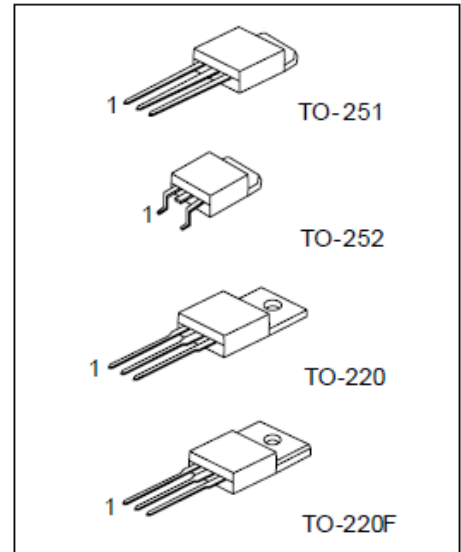
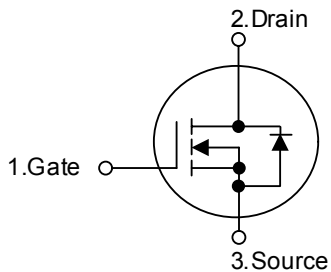
■ DESCRIPTION

The YR 20P06 is a low voltage MOSFET and is designed to have better characteristics, such as fast switching time, low gate charge, low on-state resistance and have a high rugged avalanche characteristics. This power MOSFET is usually used at high speed switching applications in power supplies, PWM motor controls, high efficient DC to DC converters and bridge circuits.

■ FEATURES

- * $R_{DS(ON)} = 90m\ \Omega @ V_{GS} = -10\ V$
- * Ultra low gate charge (typical 15 nC)
- * Low reverse transfer Capacitance ($C_{RSS} =$ typical 40 pF)
- * Fast switching capability
- * Avalanche energy Specified
- * Improved dv/dt capability, high ruggedness

■ SYMBOL



■ ABSOLUTE MAXIMUM RATING ($T_C = 25^\circ\text{C}$ unless otherwise specified)

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Drain-Source Voltage		V_{DS}	-60	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	$T_C = 25^\circ\text{C}$	I_D	-12	A
	$T_C = 70^\circ\text{C}$		-10	
Pulsed Drain Current ¹		I_{DM}	-30	
Power Dissipation	$T_C = 25^\circ\text{C}$	P_D	28	W
	$T_C = 70^\circ\text{C}$		18	
Operating Junction & Storage Temperature Range		T_J, T_{stg}	-55 to 150	$^\circ\text{C}$
Lead Temperature (¹ / ₁₆ " from case for 10 sec.)		T_L	275	

■ THERMAL DATA

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Case	$R_{\theta JC}$		3	$^\circ\text{C} / \text{W}$
Junction-to-Ambient	$R_{\theta JA}$		75	$^\circ\text{C} / \text{W}$

¹Pulse width limited by maximum junction temperature.

²Duty cycle $\leq 1\%$

■ ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX	
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-60			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1	-2	-3	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 20V$			± 250	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -48V, V_{GS} = 0V$			-1	μA
		$V_{DS} = -44V, V_{GS} = 0V, T_J = 125^\circ C$			-10	
On-State Drain Current ¹	$I_{D(ON)}$	$V_{DS} = -5V, V_{GS} = -10V$	-32			A

Drain-Source On-State Resistance ¹	R _{DS(ON)}	V _{GS} = -10 V, I _D = -7.0 A		70	90	m Ω
		V _{GS} = -5.0 V, I _D = -7.50A		100	130	
Forward Transconductance ¹	g _{fs}	V _{DS} = -10 V, I _D = -7.0 A		11		S
DYNAMIC						
Input Capacitance	C _{iss}	V _{GS} = 0V, V _{DS} = -30V, f = 1MHz		760		pF
Output Capacitance	C _{oss}			90		
Reverse Transfer Capacitance	C _{rss}			40		
Total Gate Charge ²	Q _g	V _{DS} = 0.5V _{(BR)DSS} , V _{GS} = -10V, I _D = -7.0 A		15		nC
Gate-Source Charge ²	Q _{gs}			2.5		
Gate-Drain Charge ²	Q _{gd}			3.0		
Turn-On Delay Time ²	t _{d(on)}	V _{DS} = -20V I _D ≅ -1A, V _{GS} = -10V, R _{GS} = 6 Ω		7	14	nS
Rise Time ²	t _r			10	20	
Turn-Off Delay Time ²	t _{d(off)}			19	34	
Fall Time ²	t _f			12	22	
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T _c = 25 °C)						
Continuous Current	I _S				-1.3	A
Pulsed Current ³	I _{SM}				-2.6	
Forward Voltage ¹	V _{SD}	I _F = I _S , V _{GS} = 0V			-1	V
Reverse Recovery Time	t _{rr}	I _F = -7 A, dI _F /dt = 100A / μS		15.5		nS
Reverse Recovery Charge	Q _{rr}			7.9		nC

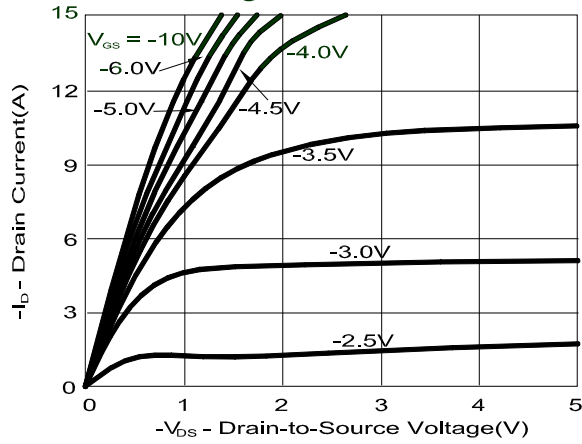
¹Pulse test : Pulse Width $\leq 300\text{ }\mu\text{sec}$, Duty Cycle $\leq 2\%$.

²Independent of operating temperature.

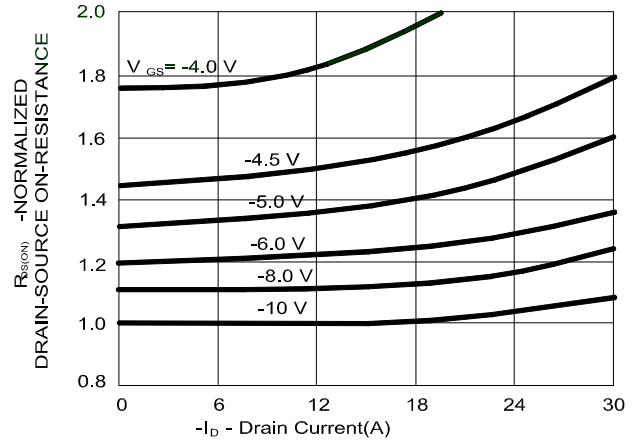
³Pulse width limited by maximum junction temperature.

TYPICAL PERFORMANCE CHARACTERISTICS

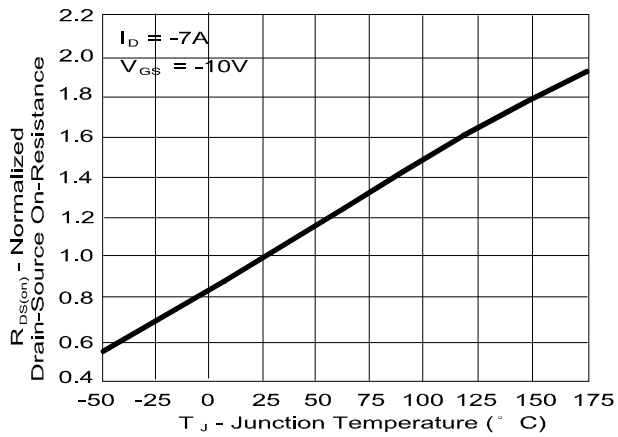
On-Region Characteristics



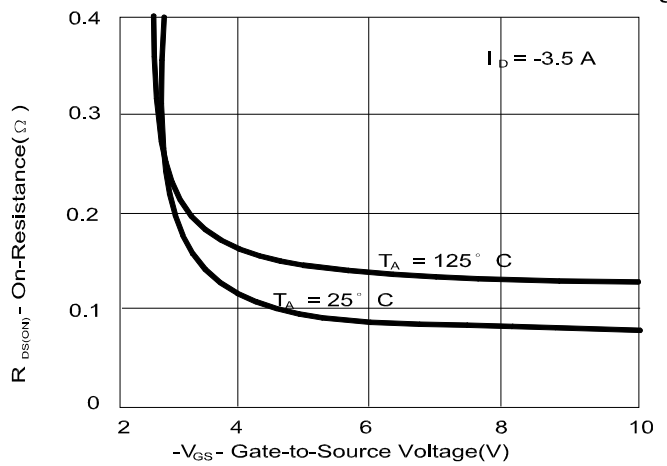
On-Resistance Variation with Drain Current and Gate Voltage



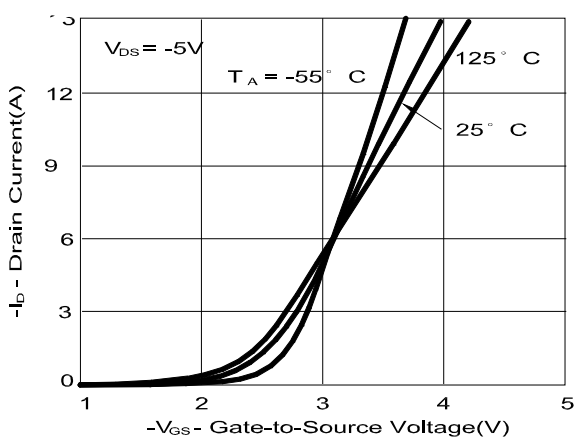
On-Resistance Variation with Temperature



On-Resistance Variation with Gate-to-Source Voltage



Transfer Characteristics



Body Diode Forward Voltage Variation with Source Current and Temperature

