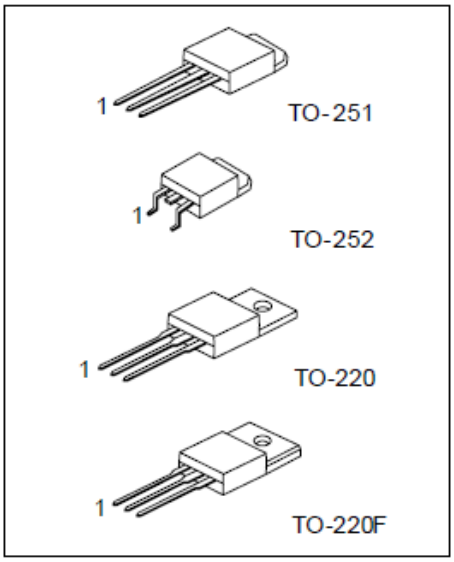
12Amps, 100Volts
N-CHANNEL MOSFET



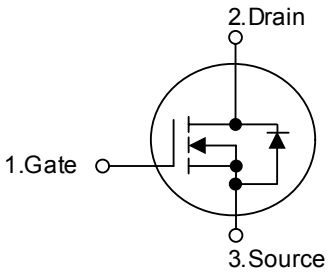
■ DESCRIPTION

The YR 12N10 is a high 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

* $R_{DS(ON)}$ = 160mΩ @V_{GS} = 10 V
* Ultra low gate charge (typical 18 nC)
* Low reverse transfer Capacitance (C_{RSS} = typical 64 pF)
* Fast switching capability
* Avalanche energy Specified
* Improved dv/dt capability, high ruggedness

■ SYMBOL



ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C Unless Otherwise Noted)

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_C = 25 °C	I_D	12	A
	T_C = 100 °C		7	
Pulsed Drain Current[1]		I_{DM}	40	
Avalanche Current		I_{As}	24	
Avalanche Energy	L = 0.1mH	E_{AS}	29	mJ
Power Dissipation	T_C = 25 °C	P_D	42	W
	T_C = 100 °C		17	
Operating Junction & Storage Temperature Range		T_j, T_{stg}	-55 to 150	°C

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Case	$R_{\theta JC}$		3	°C / W
Junction-to-Ambient	$R_{\theta JA}$		62.5	

[1]Pulse width limited by maximum junction temperature.

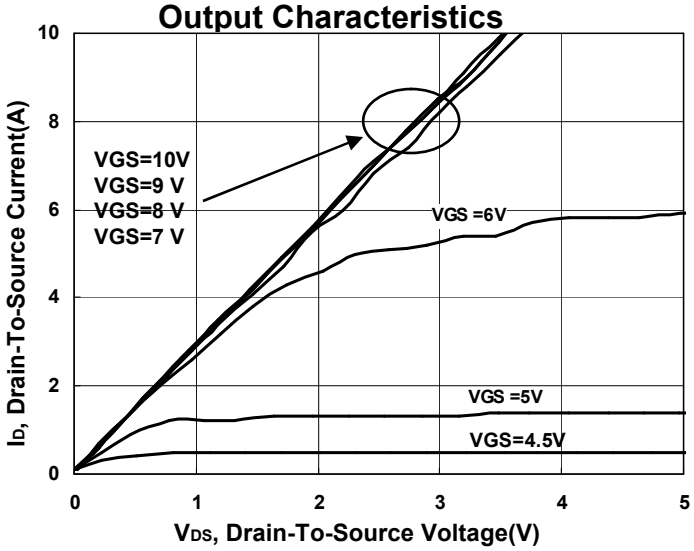
ELECTRICAL CHARACTERISTICS (T_J = 25 °C, Unless Otherwise Noted)

PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX	
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	100			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	2.0	3.2	4.0	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V			±250	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 80V, V_{GS} = 0V			1	μA
		V_{DS} = 66V, V_{GS} = 0V, T_J = 125 °C			10	
On-State Drain Current[1]	$I_{D(ON)}$	V_{DS} = 10V, V_{GS} = 10V	40			A
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	VGS = 10V, ID = 5.5A		145	160	mΩ
Forward Transconductance[1]	g_{fs}	V_{DS} = 10V, I_D = 5.5A		2		S

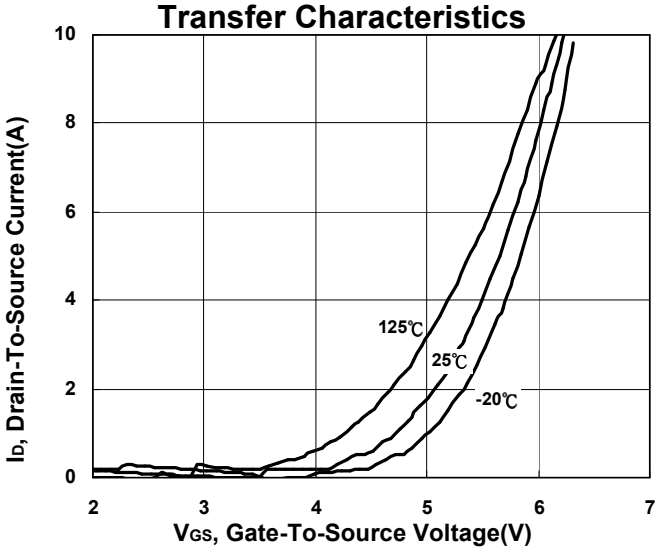
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		1060		pF
Output Capacitance	C_{oss}			124		
Reverse Transfer Capacitance	C_{rss}			64		
Total Gate Charge[2]	Q_g	V_{DS} =50V, V_{GS} = 10V, I_D = 5.5A		18		nC
Gate-Source Charge[2]	Q_{gs}			5		
Gate-Drain Charge[2]	Q_{gd}			6		
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DD} = 50V, $I_D \cong$ 5.5A, V_{GS} = 10V, R_{GS} = 25Ω		10		nS
Rise Time[2]	t_r			40		
Turn-Off Delay Time[2]	$t_{d(off)}$			30		
Fall Time[2]	t_f			28		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)						
Continuous Current	I_S				12	A
Forward Voltage[1]	V_{SD}	I_F = 5.5A, V_{GS} = 0V			1.2	V
Reverse Recovery Time	t_{rr}	I_F = 5.5A, dI_F/dt = 100A / μS		92		nS
Reverse Recovery Charge	Q_{rr}			280		nC

[1]Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.
[2]Independent of operating temperature.

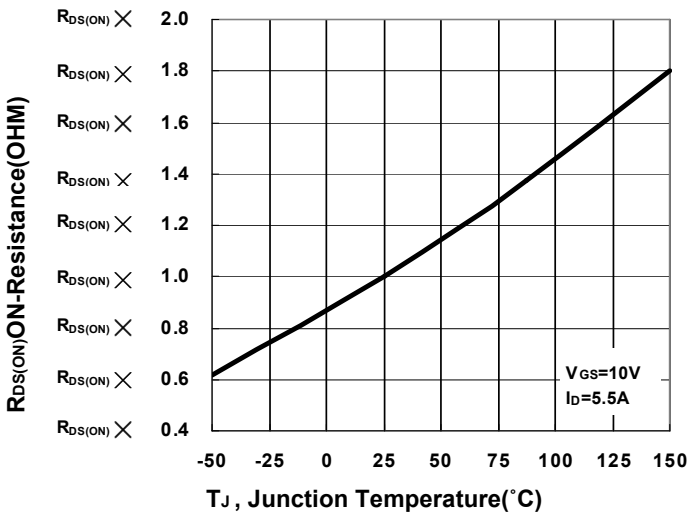
Output Characteristics

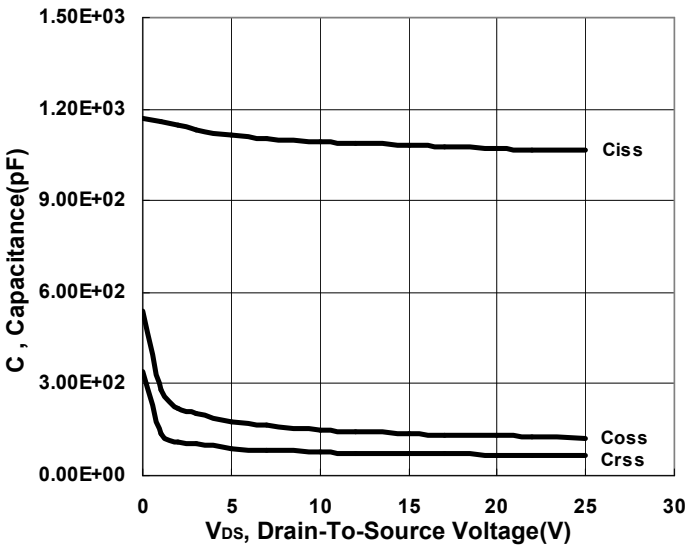


Transfer Characteristics

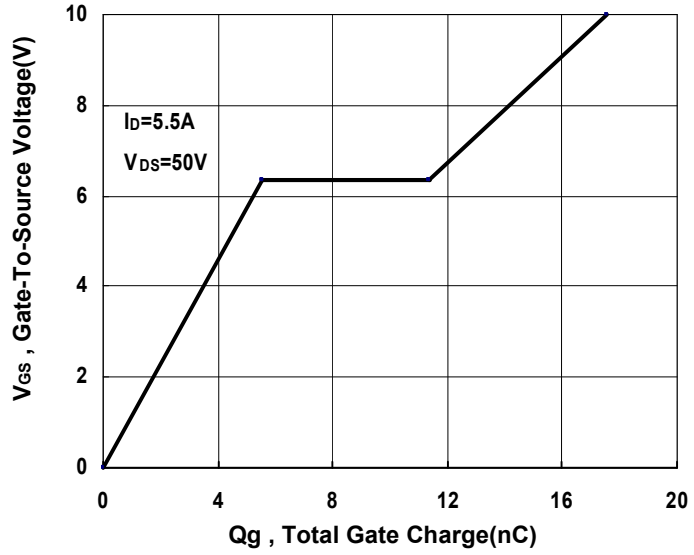


On-Resistance VS Temperature

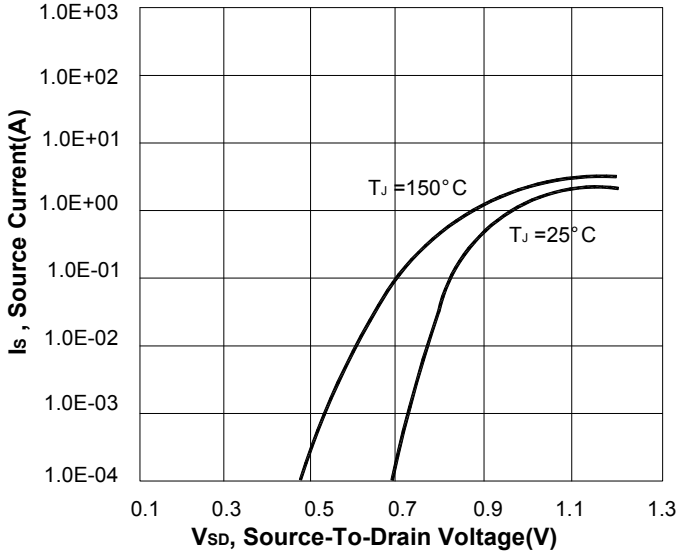




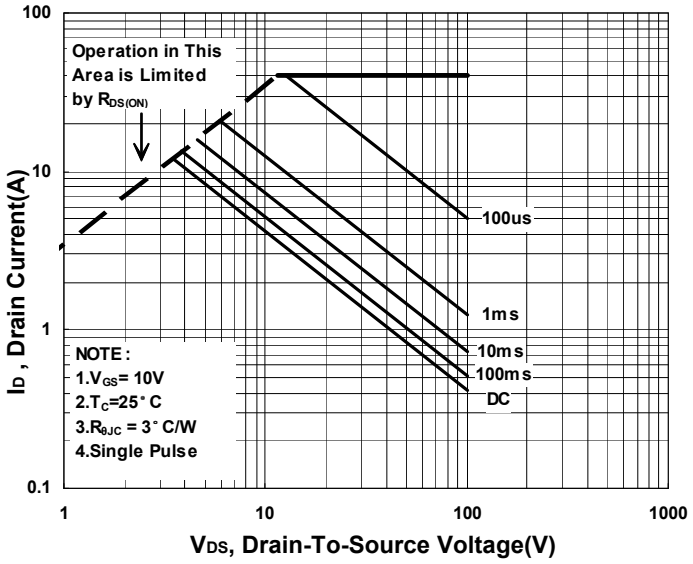
Gate charge Characteristics



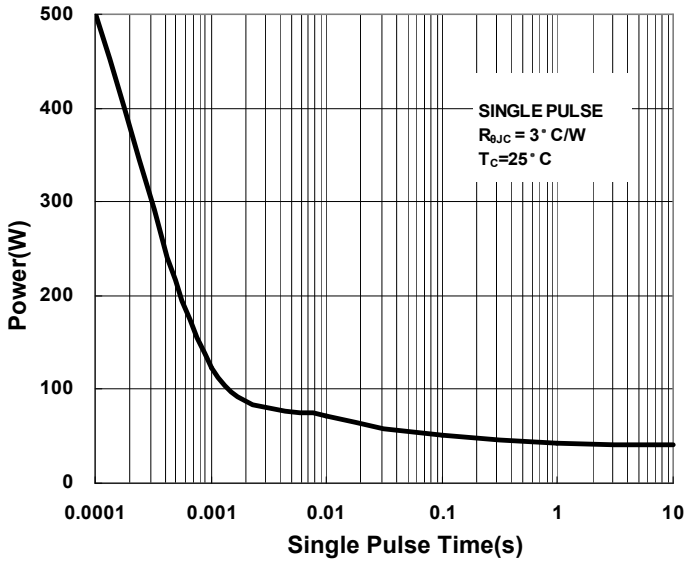
Source-Drain Diode Forward Voltage



Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve