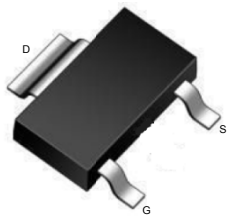
N-channel 200V 110mΩ Power MOSFET

Description

WMOS^{TM} JN is suitable for applications which require superior power density and outstanding efficiency.

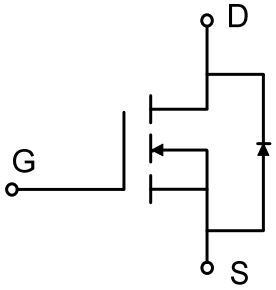


SOT-223-2L

Features

- Gate charge minimized
- Typ. $R_{DS(on)}$ =110 mΩ
- 100% UIS tested
- Pb-free plating, Halogen free

RoHS compliant



Applications

Switching applications

Absolute Maximum Ratings

Parameter	Symbol	WMF18N20JN	Unit
Drain-source voltage	V_{DSS}	200	V
Continuous drain current[1] (T_C = 25°C)	I_D	13	A
(T_C = 100°C)		7	A
Pulsed drain current[2]	I_{DM}	39	A
Gate-source voltage	V_{GS}	±20	V
Avalanche energy, single pulse[3]	E_{AS}	80	mJ
Avalanche energy, repetitive[2]	E_{AR}	0.15	mJ
Avalanche current, repetitive[2]	I_{AR}	1.2	A
Power dissipation (T_C = 25°C)	P_D	6.9	W
- Derate above 25°C		0.06	W/°C
Operating and storage temperature range	T_j, T_{stg}	-55 to +150	°C
Continuous diode forward current	I_S	13	A
Diode pulse current	$I_{S,pulse}$	39	A

Thermal Characteristics

Parameter	Symbol	WMF18N20JN	Unit
Thermal resistance, junction-to-case	$R_{\theta JC}$	18	°C/W
Thermal resistance, junction-to-ambient	$R_{\theta JA}$	80	°C/W

Electrical Characteristics T_c = 25°C, unless otherwise noted

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static characteristics						
Drain-source breakdown voltage	BV_{DSS}	V_{GS}=0 V, I_D=1 mA	200	-	-	V
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=0.25mA	2.5	3.5	4.5	V
Drain cut-off current	I_{DSS}	V_{DS}=200 V, V_{GS}=0V,				μA
		T_j = 25°C	-	-	1	
		T_j = 125°C	-	30	-	
Gate leakage current, forward	I_{GSSF}	V_{GS}=20V, V_{DS}=0V	-	-	500	nA
Drain-source on-state resistance	$R_{DS(on)}$	V_{GS}=10 V, I_D=4A	-			
		T_j = 25°C	-	110	135	mΩ
Dynamic characteristics						
Input capacitance	C_{iss}	V_{DS}= 100V, V_{GS}= 0V,	-	375	-	pF
Output capacitance	C_{oss}	f = 1 MHz	-	13	-	
Reverse transfer capacitance	C_{rss}		-	1.4	-	
Turn-on delay time	$t_{d(on)}$	V_{DD} = 100V, I_D = 5A	-	5	-	ns
Rise time	t_r	R_G = 4.7Ω, V_{GS}=10V	-	4	-	
Turn-off delay time	$t_{d(off)}$		-	13	-	
Fall time	t_f		-	2	-	
Gate charge characteristics						
Gate to source charge	Q_{gs}	V_{DD}=160V, I_D=5A,	-	2.6	-	nC
Gate to drain charge	Q_{gd}	V_{GS}=0 to 10V	-	1.4	-	
Gate charge total	Q_g		-	7.2	-	
Gate plateau voltage	$V_{plateau}$		-	5.5	-	V
Reverse diode characteristics						
Diode forward voltage	V_{SD}	V_{GS}=0 V, I_F=4A	-	-	1.2	V
Reverse recovery time	t_{rr}	V_R=50V, I_F=5A,	-	80	-	ns
Reverse recovery charge	Q_{rr}	dI_F/dt=100A/μs	-	0.2	-	μC
Peak reverse recovery current	I_{rrm}		-	5.5	-	A

Notes:

1. DPAK equivalent. Limited by $T_{j\,max}$. Maximum duty cycle D=0.5.

2. Repetitive rating: pulse width limited by maximum junction temperature.

3. I_{AS} = 1.5A, V_{DD} = 50V, R_G = 25Ω, starting T_j = 25°C.

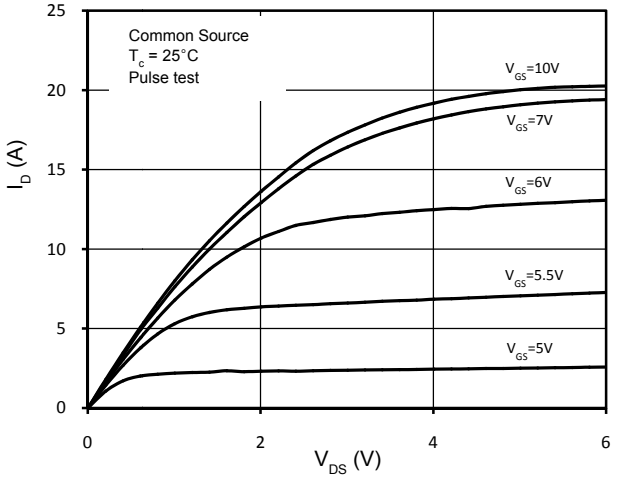


Figure 1.On-Region Characteristics

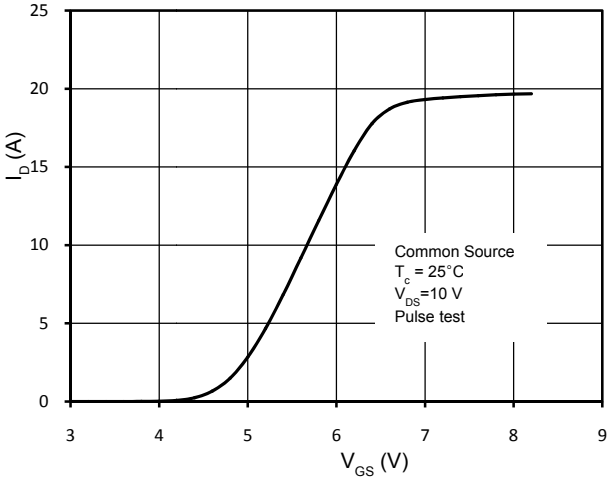


Figure 2. Transfer Characteristics

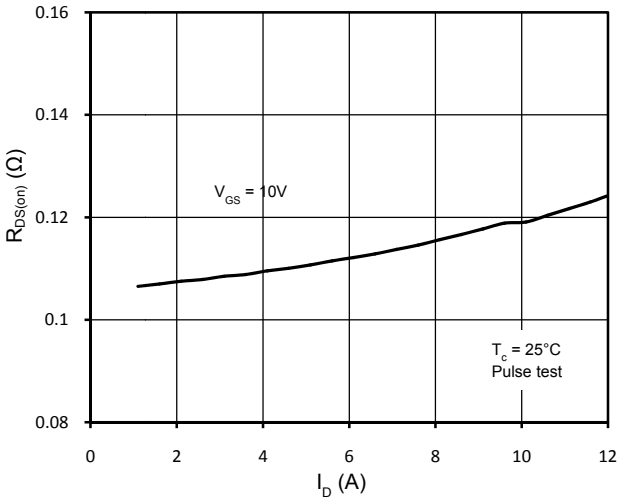


Figure 3. Static Drain-Source On Resistance

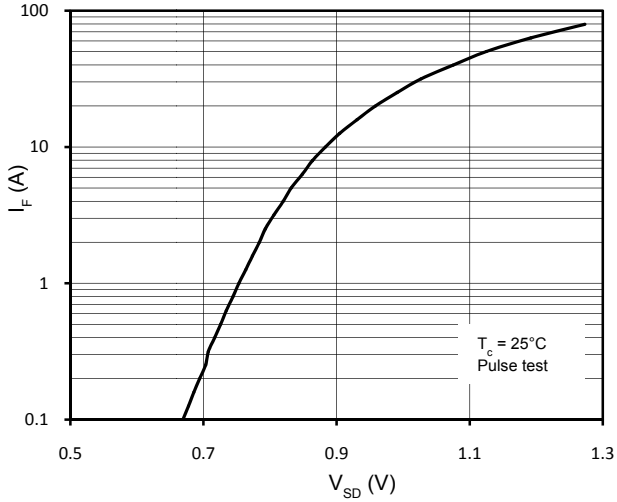


Figure 4. Body- Diode Forward Characteristics

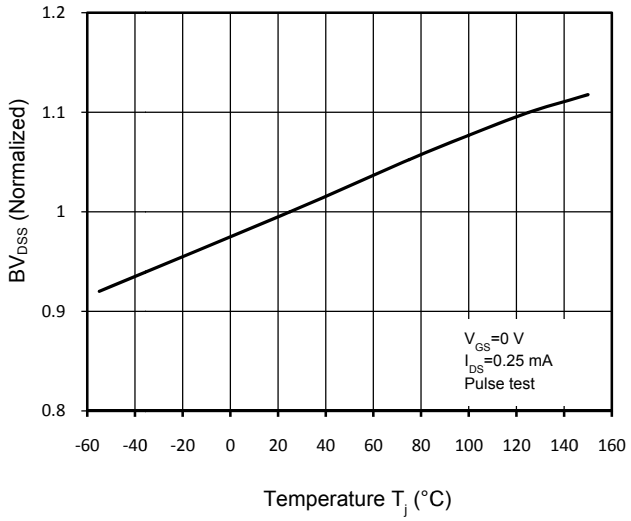


Figure 5. Normalized BV_{DSS} vs. Temperature

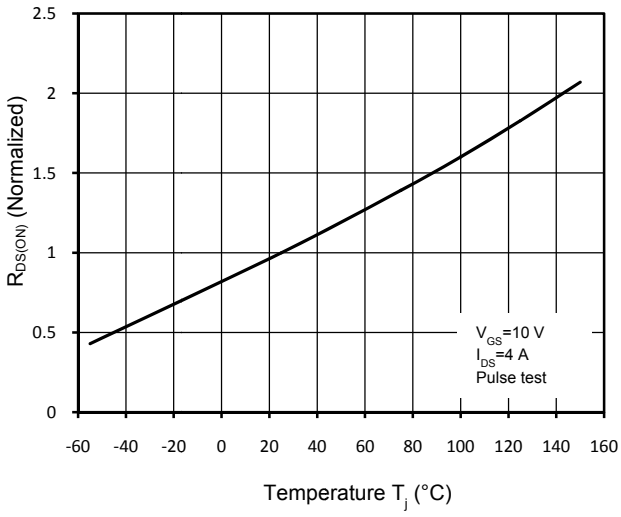


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

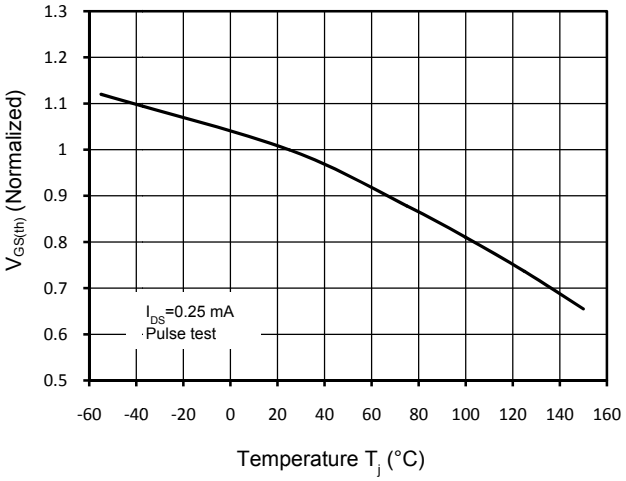


Figure 7. Threshold Voltage vs. Temperature

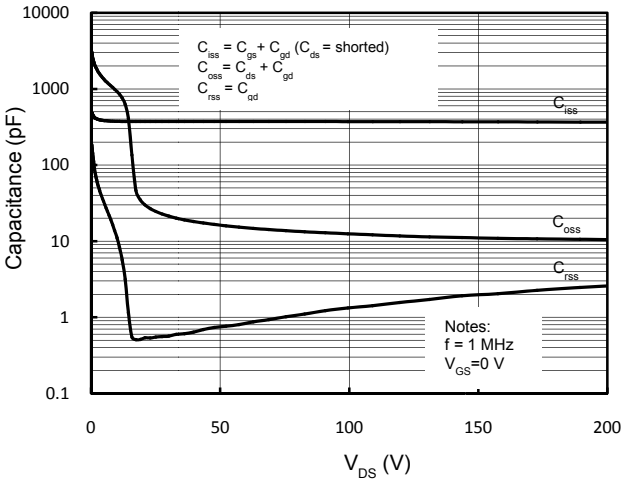


Figure 8. Capacitance Characteristics

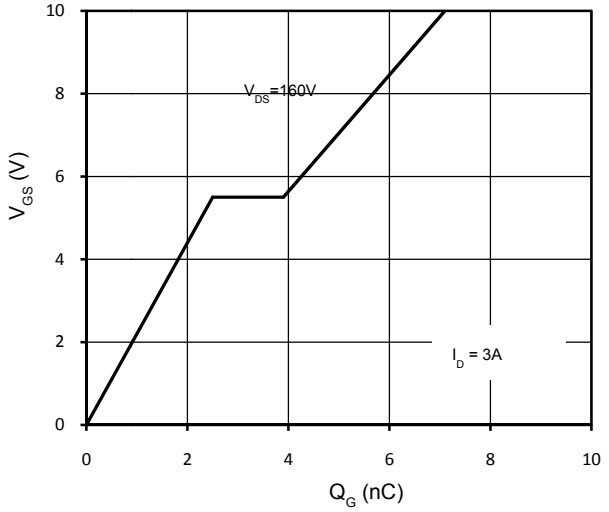


Figure 9. Gate Charge Characteristics

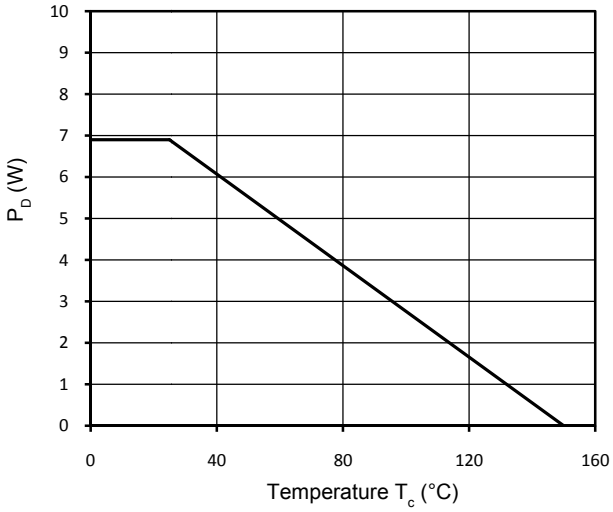


Figure 10. Power Dissipation

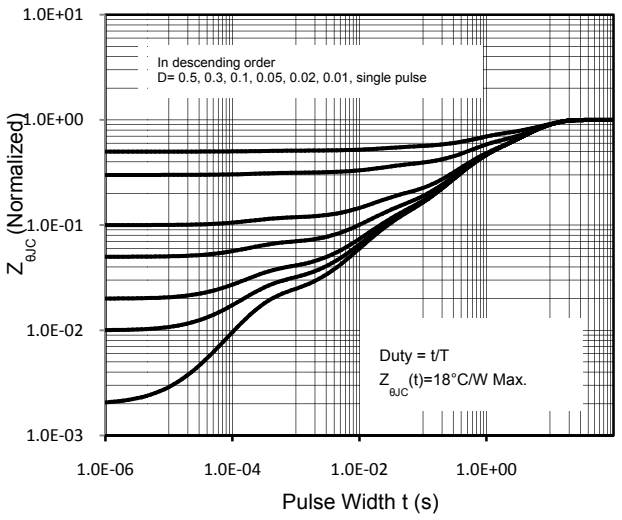


Figure 11. Transient Thermal Response Curve

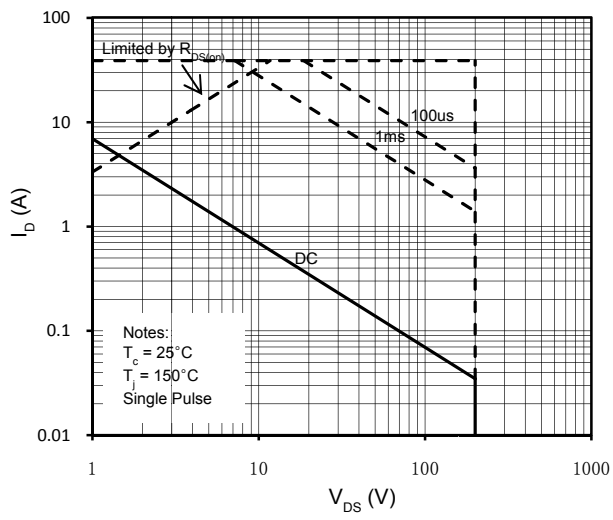
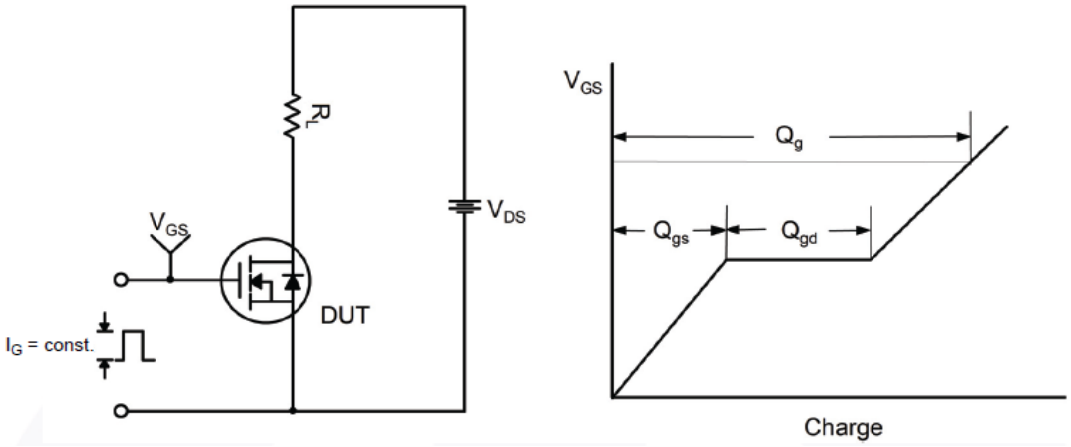
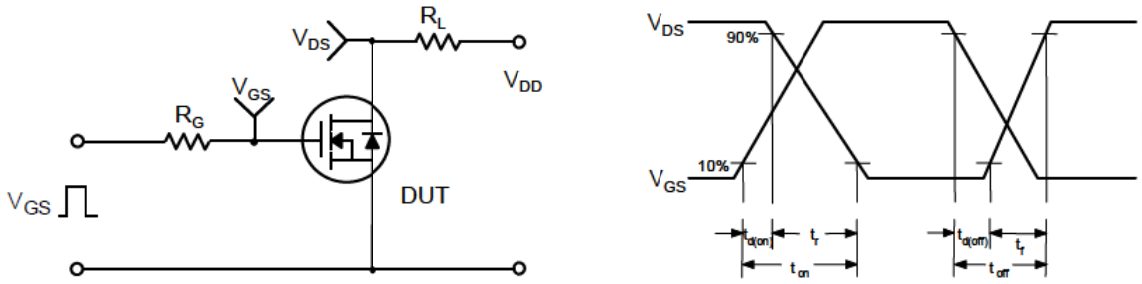


Figure 12. Maximum Safe Operating Area

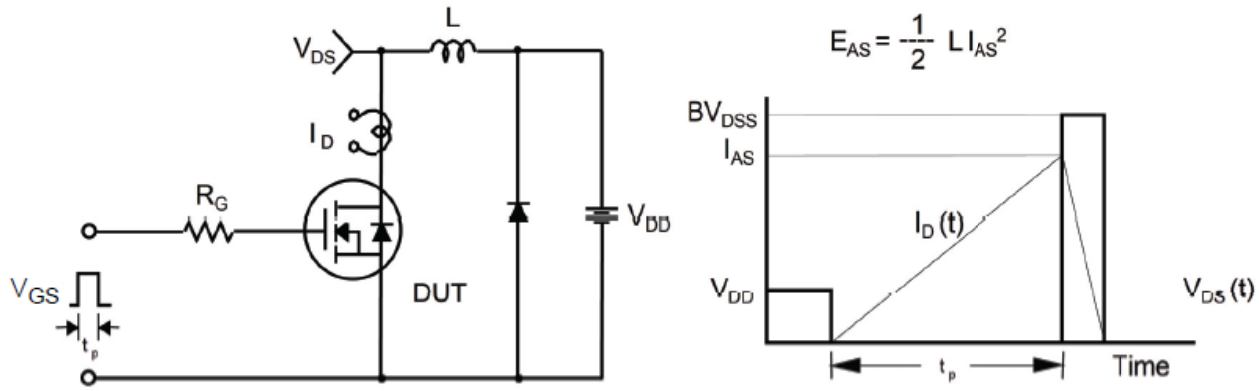
Gate Charge Test Circuit & Waveform



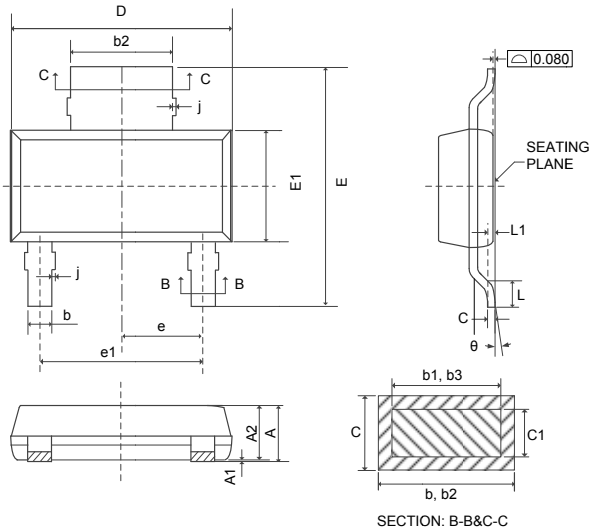
Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms



Mechanical Dimensions for SOT-223-2L



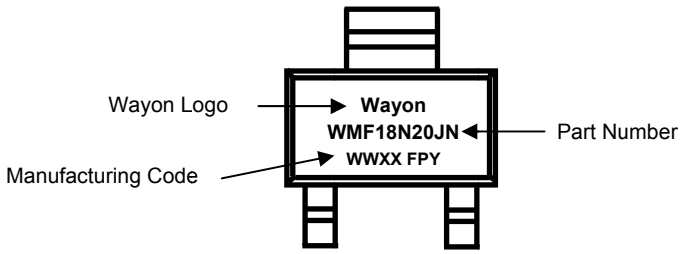
COMMON DIMENSIONS

SYMBOL	mm	
	MIN	MAX
A	-	1.80
A1	0.02	0.10
A2	1.50	1.70
b	0.6	0.84
b1	0.6	0.79
b2	2.90	3.10
b3	2.84	3.05
C	0.23	0.35
C1	0.23	0.33
D	6.30	6.95
E	6.70	7.30
E1	3.30	3.70
e	2.30 BSC	
e1	4.60 BSC	
L	0.81	-
L1	0.25 BSC	
θ	0°	10°
j	-	0.15

Ordering Information

Part	Package	Marking	Packing method
WMF18N20JN	SOT-223-2L	WMF18N20JN	Tape and Reel

Marking Information



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