

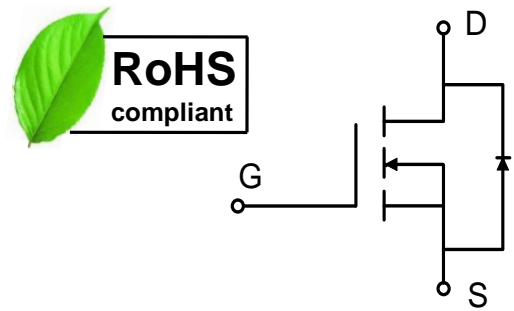
30V N-Channel Enhancement Mode Power MOSFET

Description

WMR10N03T1 uses advanced power trench technology that has been especially tailored to minimize the on-state resistance and yet maintain superior switching performance.

Features

- $V_{DS} = 30V$, $I_D = 10 A$
 $R_{DS(on)} < 12m\Omega @ V_{GS} = 10 V$
 $R_{DS(on)} < 16.5m\Omega @ V_{GS} = 4.5V$
- Green Device Available
- Super Low Gate Charge
- 100% EAS Guaranteed
- Advanced High Cell Density Trench Technology



Applications

- Battery Management,
- Power Management
- DC-DC Converters

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current@10V ¹	I_D	$T_A=25^\circ C$	10
		$T_A=70^\circ C$	8
Pulsed Drain Current ²	I_{DM}	50	A
Single Pulse Avalanche Energy ³	EAS	24.2	mJ
Avalanche Current	I_{AS}	22	A
Total Power Dissipation ⁴	P_D	$T_C=25^\circ C$	26
		$T_A=25^\circ C$	1.67
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ C$

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction-to-Ambient ¹	$R_{\theta JA}$	75	$^\circ C/W$
Thermal Resistance from Junction-to-Case ¹	$R_{\theta JC}$	4.8	$^\circ C/W$

Electrical Characteristics T_c = 25°C, unless otherwise noted

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit	
Static Characteristics							
Drain-Source Breakdown Voltage	V_{(BR)DSS}	V _{GS} = 0V, I _D = 250μA	30	-	-	V	
Gate-body Leakage current	I_{GSS}	V _{DS} = 0V, V _{GS} = ±20V	-	-	±100	nA	
Zero Gate Voltage Drain Current	I_{DSS}	V _{DS} = 24V, V _{GS} = 0V	T _J =25°C	-	-	1	μA
			T _J =55°C	-	-	5	
Gate-Threshold Voltage	V_{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	1.0	1.75	2.5	V	
Drain-Source On-Resistance ²	R_{DS(on)}	V _{GS} = 10V, I _D = 15A	-	9.5	12	mΩ	
		V _{GS} = 4.5V, I _D = 10A	-	12.6	16.5		
Forward Transconductance	g_{fs}	V _{DS} = 5V, I _D = 15A	-	24.4	-	S	
Dynamic Characteristics							
Input Capacitance	C_{iss}	V _{DS} = 15V, V _{GS} = 0V, f = 1MHz	-	896	-	pF	
Output Capacitance	C_{oss}		-	126	-		
Reverse Transfer Capacitance	C_{rss}		-	108	-		
Switching Characteristics							
Gate Resistance	R_g	V _{DS} =0V, V _{GS} =0V, f=1MHz	-	1.8	-	Ω	
Total Gate Charge(4.5V)	Q_g	V _{GS} = 4.5V, V _{DS} = 15V, I _D =12A	-	9.82	-	nC	
Gate-Source Charge	Q_{gs}		-	2.24	-		
Gate-Drain Charge	Q_{gd}		-	5.54	-		
Turn-On Delay Time	t_{d(on)}	V _{GS} = 10V, V _{DD} = 15V, R _G = 1.5Ω, I _D = 20A	-	6.4	-	nS	
Rise Time	t_r		-	39	-		
Turn-Off Delay Time	t_{d(off)}		-	21	-		
Fall Time	t_f		-	4.7	-		
Drain-Source Body Diode Characteristics							
Diode Forward Voltage ²	V_{SD}	I _S = 1A, V _{GS} = 0V	-	-	1.0	V	
Continuous Source Current ^{1,5}	I_S	V _G =V _D =0V, Force Current	-	-	37	A	

Notes:

- The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%
- The EAS data shows Max. rating. The test condition is V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=22A
- The power dissipation is limited by 175°C junction temperature
- The data is theoretically the same as I_D and I_{DM}, in real applications, should be limited by total power dissipation.

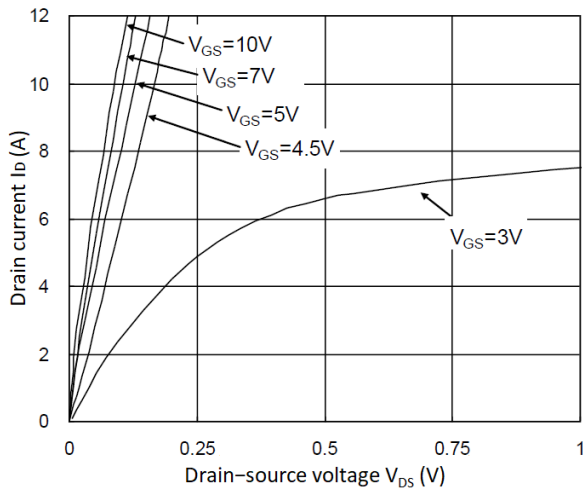


Figure 1. Output Characteristics

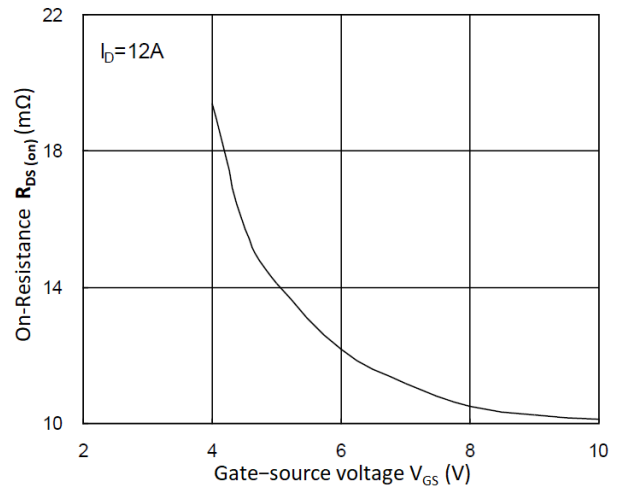


Figure 2. $R_{DS(on)}$ vs. V_{GS}

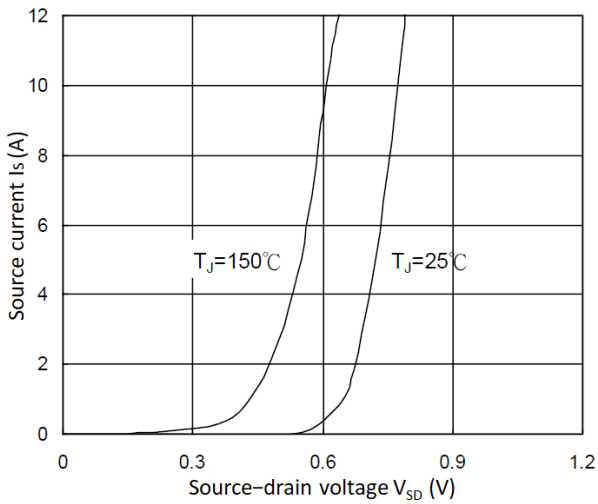


Figure 3. Forward Characteristics of Reverse

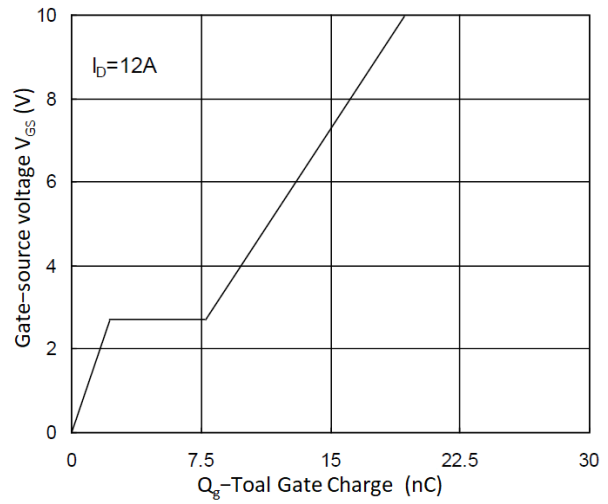


Figure 4. Gate Charge Characteristics

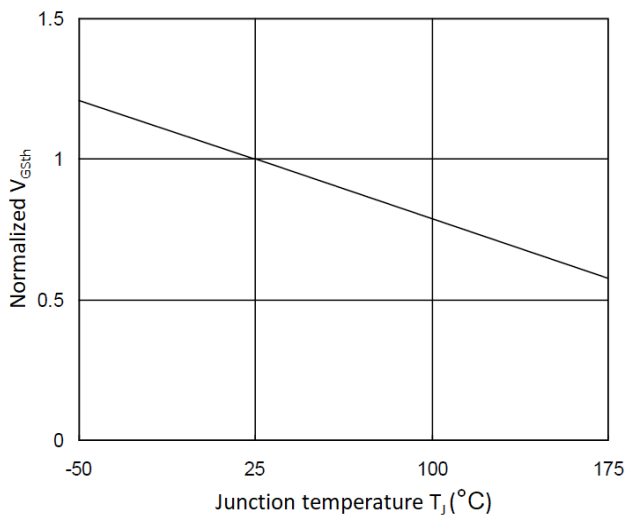


Figure 5. Normalized $V_{GS(th)}$ vs. T_J

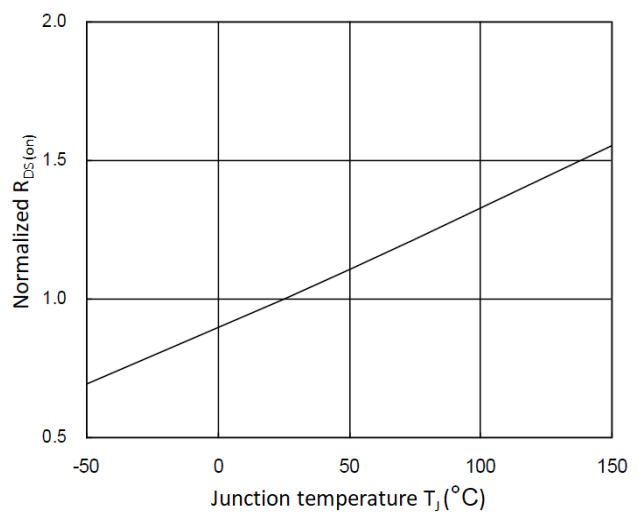


Figure 6. Normalized $R_{DS(on)}$ vs. T_J

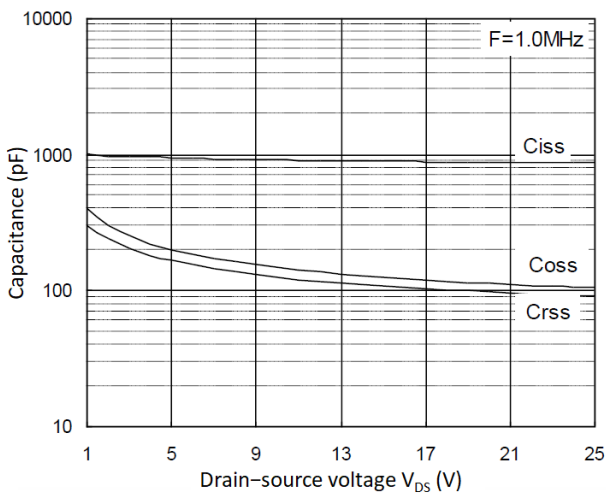


Figure 7. Capacitance Characteristics

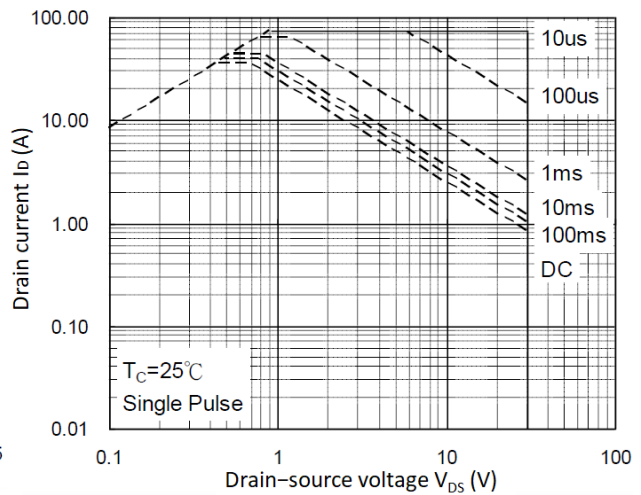


Figure 8. Safe Operating Area

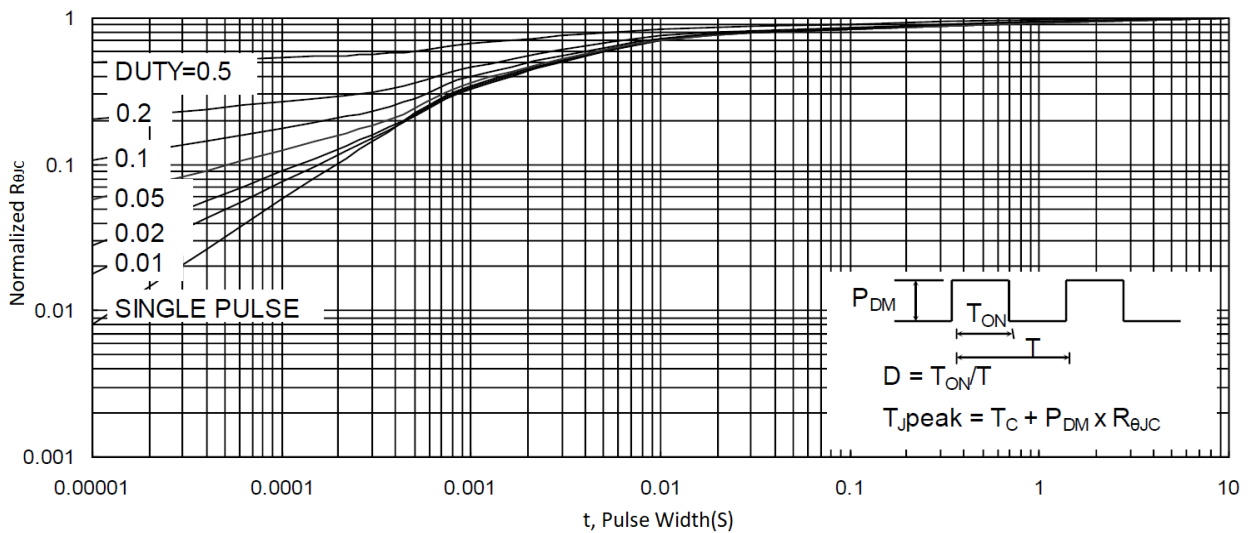


Figure 9. Normalized Maximum Transient Thermal Impedance

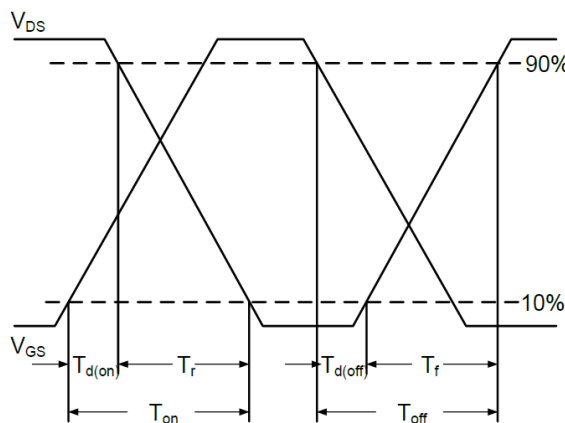


Figure 10. Switching Time Waveform

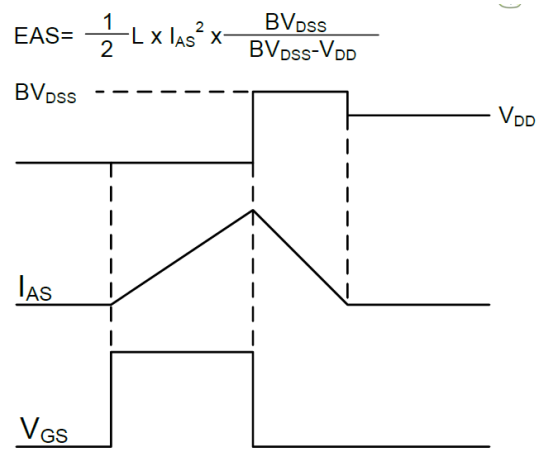
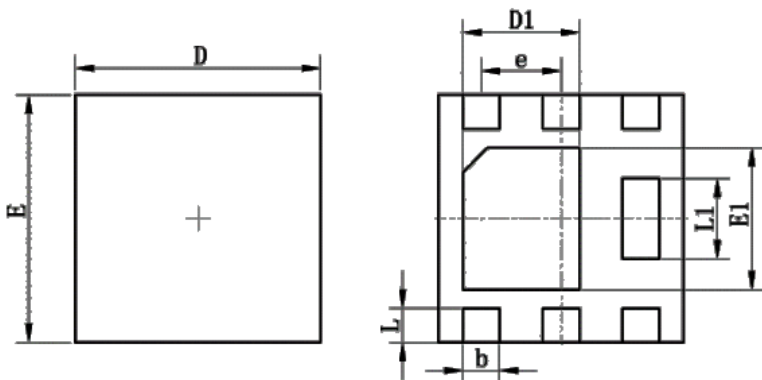


Figure 11. Unclamped Inductive Switching Waveform

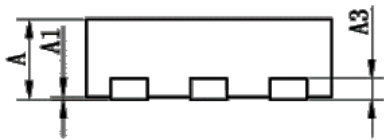
Mechanical Dimensions for DFN2020-6L

COMMON DIMENSIONS



TOP VIEW

BOTTOM VIEW



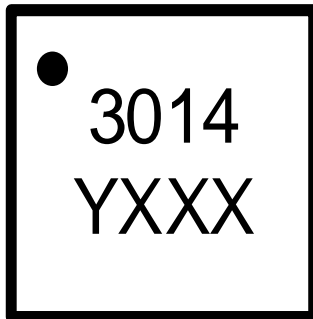
SIDE VIEW

SYMBOL	MM	
	MIN	MAX
A	0.50	0.60
A1	0.00	0.05
A3	0.152REF	
b	0.25	0.35
D	1.95	2.05
D1	0.80	1.00
E	1.95	2.05
E1	0.80	1.00
L1	0.46	0.66
e	0.65BSC	
L	0.25	0.35

Ordering Information

Part	Package	Marking	Packing method
WMR10N03T1	DFN2020-6L	3014	Tape and Reel

Marking Information



3014 = Device code

YXXX= Date code


Contact Information

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