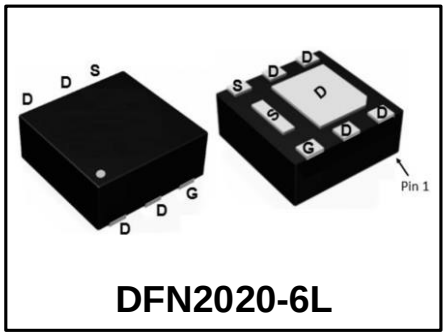
WMR16N03T1

30V N-Channel Enhancement Mode Power MOSFET



DFN2020-6L

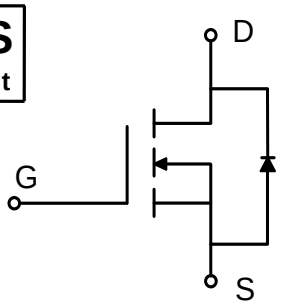
Description

WMR16N03T1 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 = 16A
  $R_{DS(on)}$ < 5.2mΩ @ V_{GS} = 10V
  $R_{DS(on)}$ < 7.2mΩ @ V_{GS} = 4.5V
- Green Device Available
- Low $R_{DS(ON)}$
- Advanced High Cell Density Trench Technology

RoHS compliant



Applications

- Battery Protection
- Power Management
- Load Switch

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]	T_A=25℃	I_D	16	A
	T_A=70℃		13.5	
Pulsed Drain Current[2]		I_{DM}	63	A
Single Pulse Avalanche Energy[3]		EAS	61.2	mJ
Avalanche Current		I_{AS}	35	A
Total Power Dissipation[4]	T_A=25℃	P_D	3.1	W
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to+150	°C

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction-to-Ambient[1]	$R_{\theta JA}$	47	°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	T_J=25℃	I_{DSS}	V_{DS} = 30V, V_{GS} = 0V	-	-	1	μA
	T_J=125℃			-	-	10	
Gate-Threshold Voltage		$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1.0	1.5	2.5	V
Drain-Source On-Resistance[2]		$R_{DS(on)}$	V_{GS} = 10V, I_D = 10A	-	3.9	5.2	mΩ
			V_{GS} = 4.5V, I_D = 8A	-	5.4	7.2	
Dynamic Characteristics							
Input Capacitance		C_{iss}	V_{DS} = 15V, V_{GS} =0V, f =1.0 MHz	-	2390	-	pF
Output Capacitance		C_{oss}		-	282	-	
Reverse Transfer Capacitance		C_{rss}		-	230	-	
Switching Characteristics							
Gate Resistance		R_g	V_{DS} = 0V, V_{GS}= 0V, f=1.0MHz	-	3.2	-	Ω
Total Gate Charge		Q_g	V_{GS} = 4.5V,V_{DS} = 15V, I_D=12A	-	10.2	-	nC
Gate-Source Charge		Q_{gs}		-	4.5	-	
Gate-Drain Charge		Q_{gd}		-	3	-	
Turn-On Delay Time		$t_{d(on)}$	V_{GS} =4.5V, V_{DD} =15V, I_D= 10A, R_{GEN}=5Ω	-	9.7	-	nS
Rise Time		t_r		-	3.2	-	
Turn-Off Delay Time		$t_{d(off)}$		-	29.1	-	
Fall Time		t_f		-	6.2	-	
Drain-Source Body Diode Characteristics							
Diode Forward Voltage[2]		V_{SD}	I_S = 10A, V_{GS} = 0V	-	0.8	1.2	V
Reverse Recovery Time		t_{rr}	I_F=10A, di/dt=100A/us	-	27.5	-	nS
Reverse Recovery Charge		Q_{rr}		-	15	-	nC

Notes:

1.The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper

2.The data tested by pulsed , pulse width ≤ 300us, duty cycle ≤ 2%

3.The EAS data shows Max. rating . The test condition is V_{DD}= 25V, V_{GS}= 10V, L= 0.1mH, I_{AS}= 35A

4.The power dissipation is limited by 150℃ junction temperature

5.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

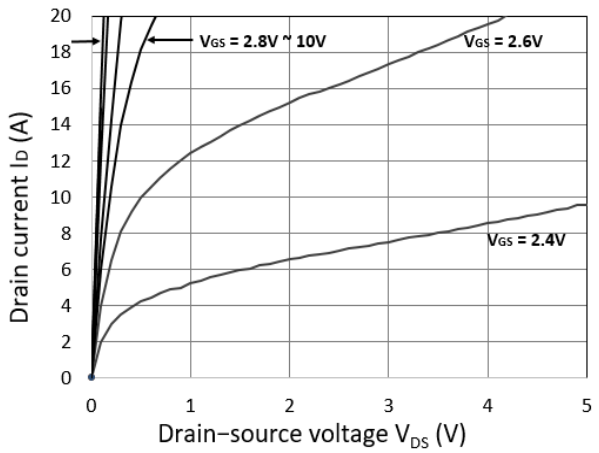


Figure 2. Transfer Characteristic

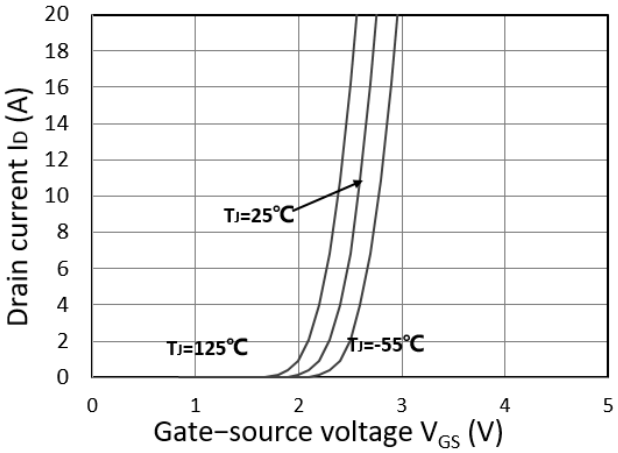


Figure 3. Capacitance Characteristics

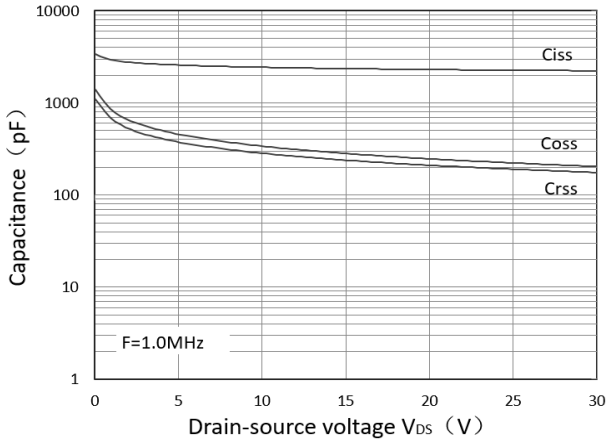


Figure 4. Gate Charge Characteristics

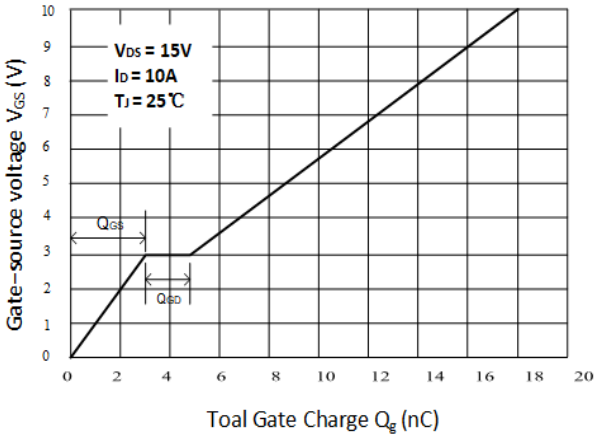


Figure 5. $R_{DS(ON)}$ vs. I_D

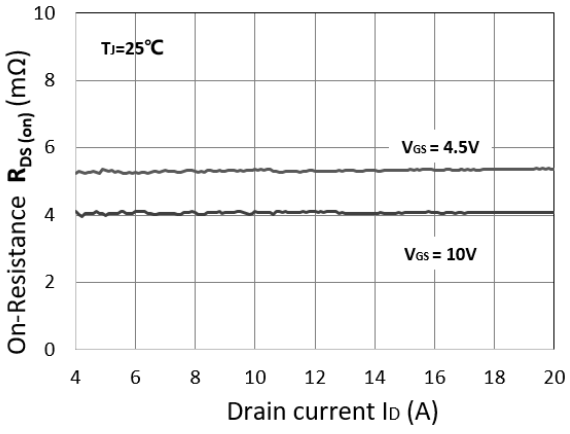


Figure 6. Normalized $R_{DS(on)}$ vs. T_J

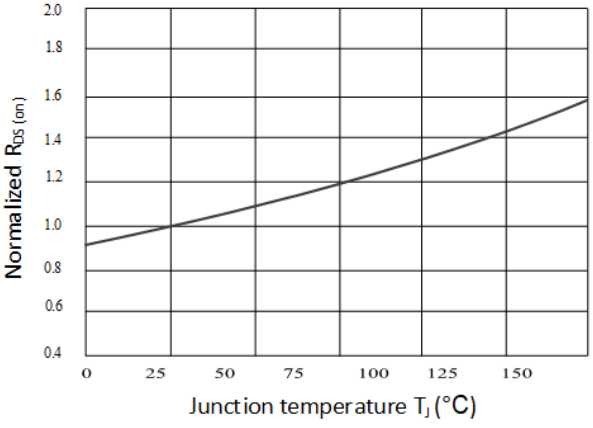


Figure 7. R_{DS}(on) vs. V_{GS}

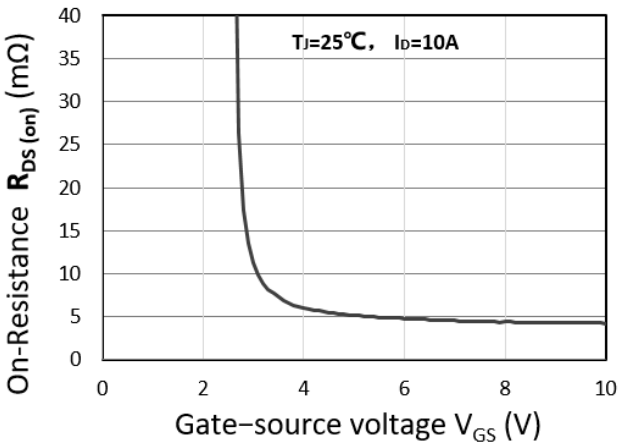


Figure 8. Forward Characteristics of Reverse

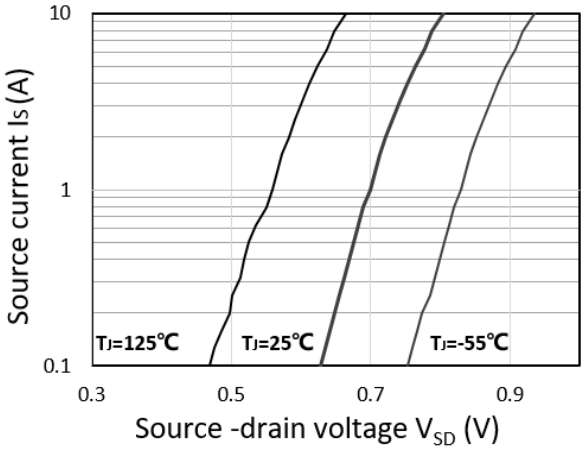


Figure 9. Switching Time Waveform

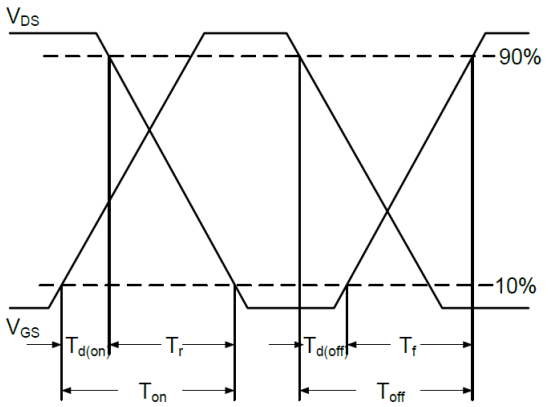
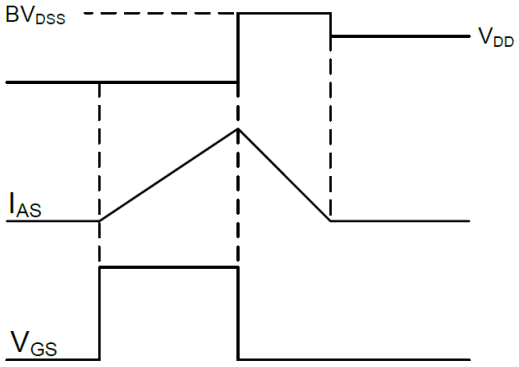
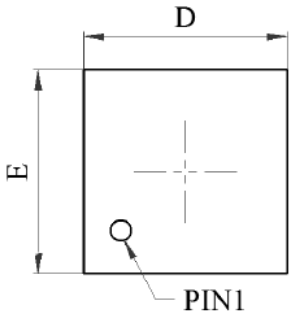


Figure 10. Unclamped Inductive Switching Waveform

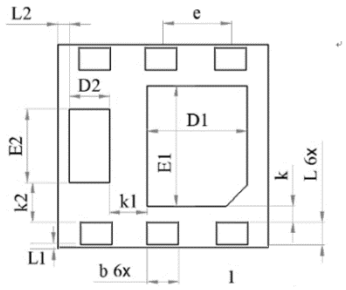
$$EAS = \frac{1}{2} L \times I_{AS}^2 \times \frac{BV_{DSS}}{BV_{DSS}-V_{DD}}$$



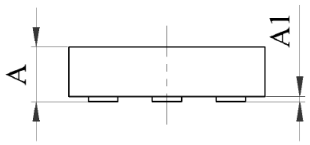
Mechanical Dimensions for DFN2020-6L



TOP VIEW



BOTTOM VIEW



SIDE VIEW

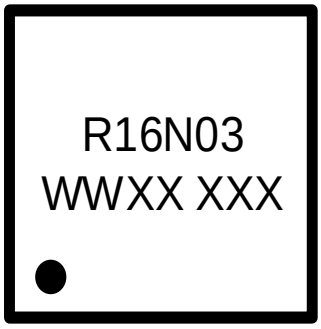
COMMON DIMENSIONS

SYMBOL	MM	
	MIN	MAX
A	0.500	0.600
A1	0.025	0.075
D	1.900	2.100
E	1.900	2.100
D1	0.850	1.050
E1	1.050	1.250
D2	0.330	0.430
E2	0.650	0.750
b	0.250	0.350
L	0.195	0.295
L1	0.030REF	
L2	0.110REF	
k	0.150REF	
k1	0.360REF	
k2	0.375REF	
e	0.650REF	

Ordering Information

Part	Package	Marking	Packing method
WMR16N03T1	DFN2020-6L	R16N03	Tape and Reel

Marking Information



R16N03 = Device code

WWXX XXX= Date code

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