Descriptions

This is N-channel Enhancement MOSFET in a DFN2020-6L Plastic Package.

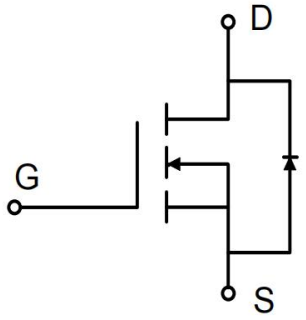
Features

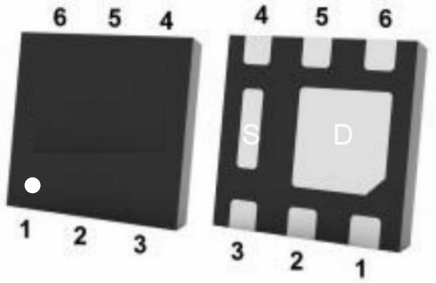
Parameter	Value	Unit
V_{DS}	20	V
$R_{DS(ON)MAX.}V_{GS}$=4.5V	6.5	mΩ
$R_{DS(ON)MAX.}V_{GS}$=2.5V	8.8	mΩ
I_D	15	A

Applications

- Power Management
- Battery Management
- DC-DC Converters

Equivalent Circuit & Pinning





出脚	定义
Pin1	D
Pin2	D
Pin3	G
Pin4	S
Pin5	D
Pin6	D

DFN2020-6L

Absolute Maximum Ratings(Ta=25℃)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	20	V
Gate-Source Voltage		V_{GS}	±10	V
Continuous Drain Current	T_A=25°C	I_D	15	A
	T_A= 100°C		9.6	
Pulsed Drain Current[1]		I_{DM}	60	A
Single Pulse Avalanche Energy[2]		EAS	39.4	mJ
Total Power Dissipation	T_A=25°C	P_D	2.2	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[3]	$R_{\theta JA}$	56	°C/W

Electrical Characteristics(Ta=25℃)

Parameter		Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics							
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	20	-	-	V
Gate-body Leakage current		I_{GSS}	V_{DS} = 0V, V_{GS} = ±10V	-	-	±100	nA
Zero Gate Voltage Drain Current	T_J=25°C	I_{DSS}	V_{DS} = 20V, V_{GS} = 0V	-	-	1	μA
	T_J= 100°C			-	-	100	
Gate-Threshold Voltage		$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	0.4	0.65	1	V
Drain-Source on-Resistance[4]		$R_{DS(on)}$	V_{GS} = 4.5V, I_D = 10A	-	4.9	6.5	mΩ
			V_{GS} = 2.5V, I_D = 8A	-	6.7	8.8	
Forward Transconductance[4]		g_{fs}	V_{DS} = 4.5V, I_D = 10A	-	35	-	S
Dynamic Characteristics[5]							
Input Capacitance		C_{iss}	V_{DS} = 10V, V_{GS} = 0V, f =1MHz	-	2125	-	pF
Output Capacitance		C_{oss}		-	306	-	
Reverse Transfer Capacitance		C_{rss}		-	277	-	
Gate Resistance		R_G	f =1MHz	-	2.5	-	Ω
Switching Characteristics[5]							
Total Gate Charge		Q_g	V_{GS} = 4.5V,V_{DS} = 10V, I_D=10A	-	23.8	-	nC
Gate-Source Charge		Q_{gs}		-	3	-	
Gate-Drain Charge		Q_{gd}		-	6.1	-	
Turn-On Delay Time		$t_{d(on)}$	V_{GS} =4.5V, V_{DD} = 10V, R_G = 3Ω, I_D= 10A	-	12	-	ns
Rise Time		t_r		-	23.3	-	
Turn-Off Delay Time		$t_{d(off)}$		-	59	-	
Fall Time		t_f		-	35	-	
Body Diode Reverse Recovery Time		t_{rr}	I_F= 10A, dI_F/dt=100A/μs		19	-	ns
Body Diode Reverse Recovery Charge		Q_{rr}			5.4	-	nC
Drain-Source Body Diode Characteristics							
Diode Forward Voltage[4]		V_{SD}	I_S = 1A, V_{GS} = 0V	-	-	1.2	V
Continuous Source Current	T_A=25°C	I_S	-	-	-	15	A

Notes:

1. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C.
2. The EAS data shows Max. rating . The test condition is V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=28A.
3. The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper, The value in any given application depends on the user's specific board design.
4. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
5. This value is guaranteed by design hence it is not included in the production test.

Electrical Characteristic Curve

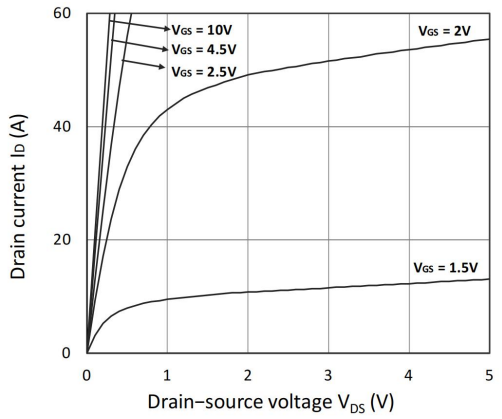


Figure 1. Output Characteristics

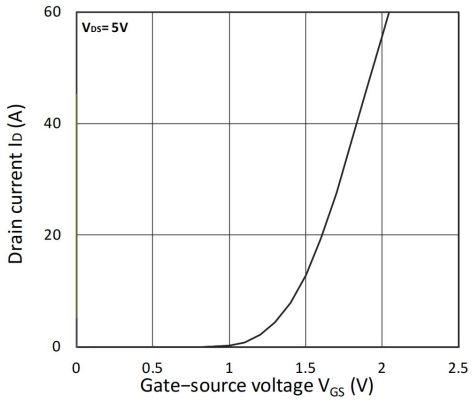


Figure 2. Transfer Characteristics

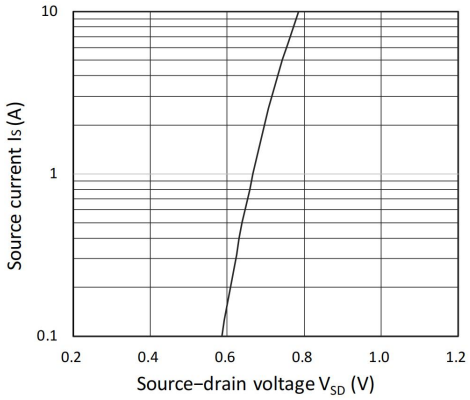


Figure 3. Forward Characteristics

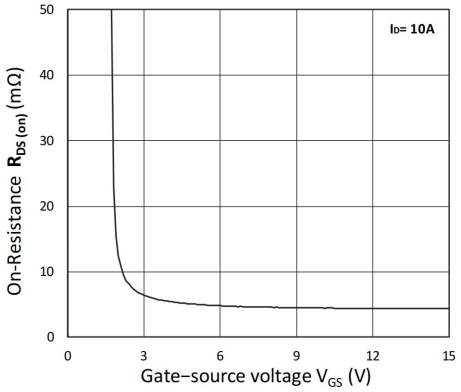


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

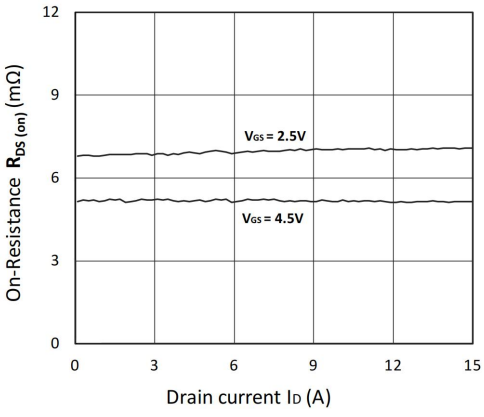


Figure 5. $R_{DS(ON)}$ vs. I_D

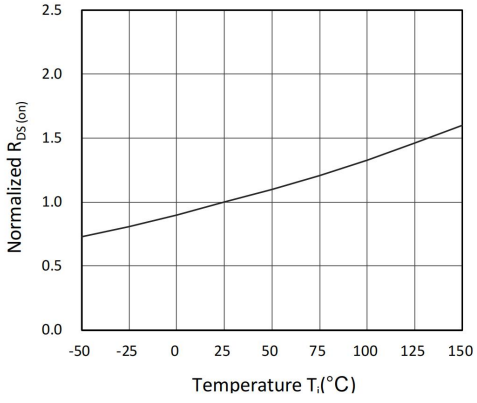


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

Electrical Characteristic Curve

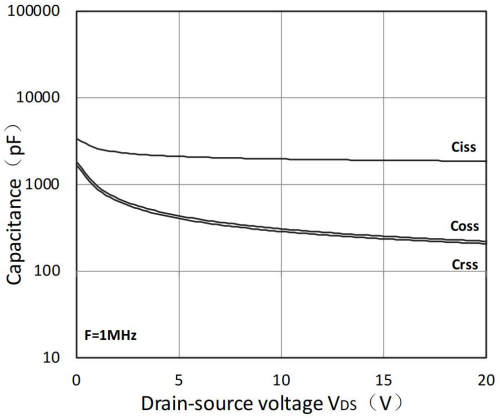


Figure 7. Capacitance Characteristics

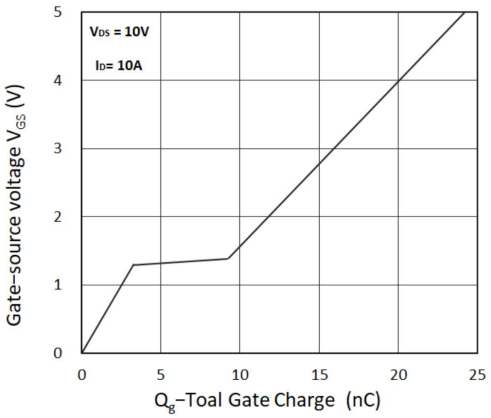


Figure 8. Gate Charge Characteristics

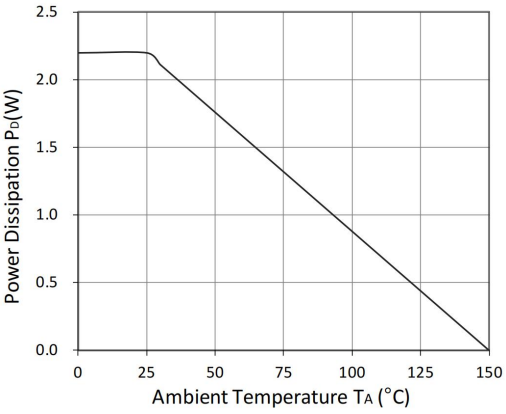


Figure 9. Power Dissipation

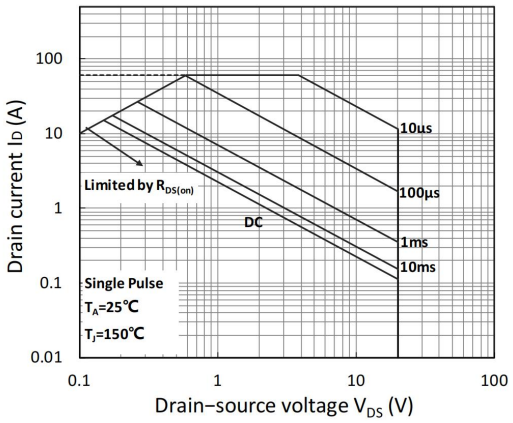


Figure10. Safe Operating Area

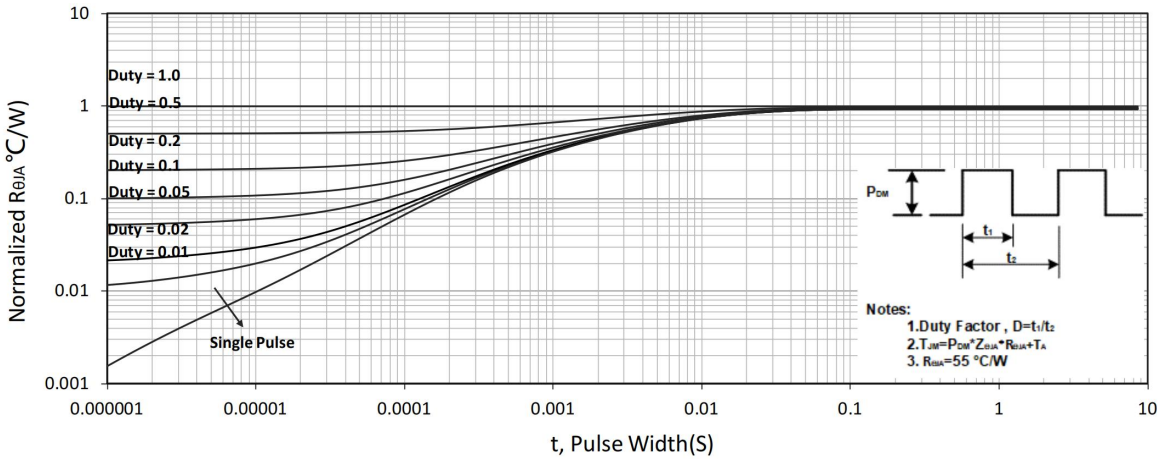


Figure 11. Normalized Maximum Transient Thermal Impedance

Test Circuit

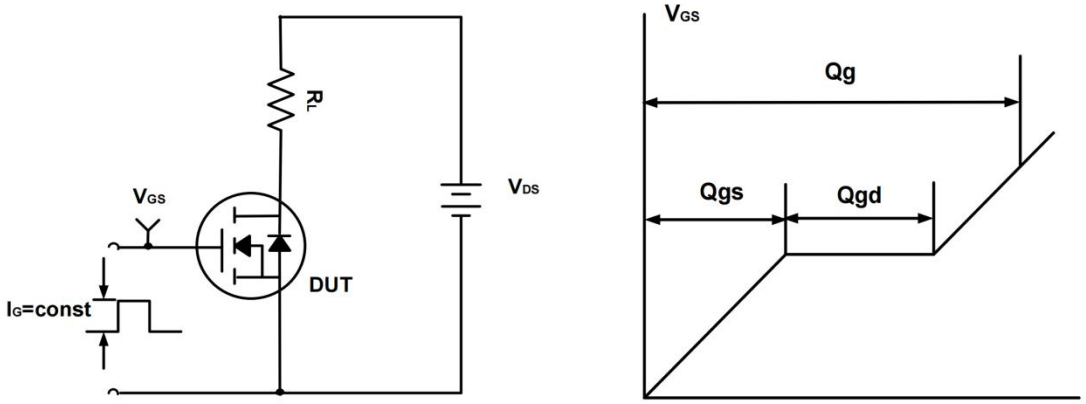


Figure A. Gate Charge Test Circuit & Waveforms

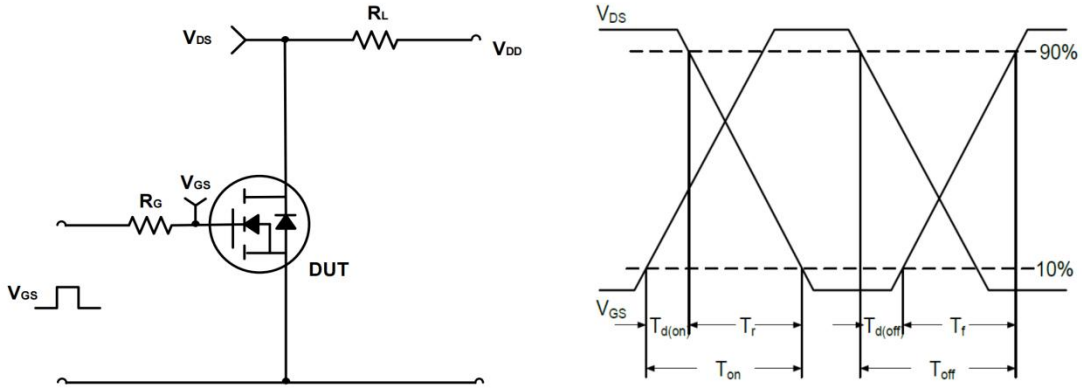


Figure B. Switching Test Circuit & Waveforms

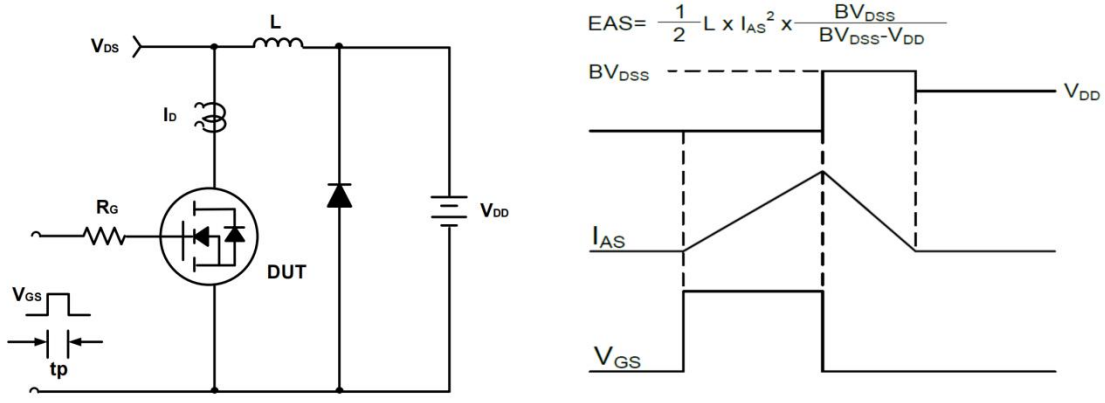
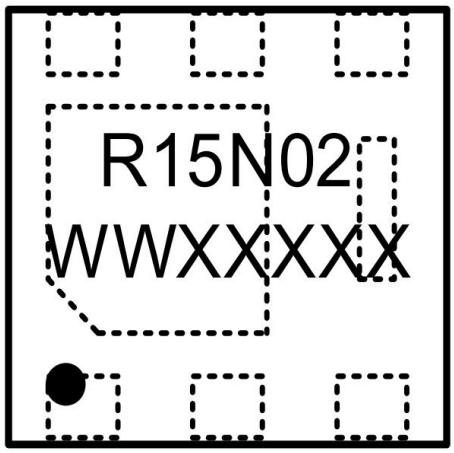


Figure C. Unclamped Inductive Switching Circuit & Waveforms

Marking Instructions



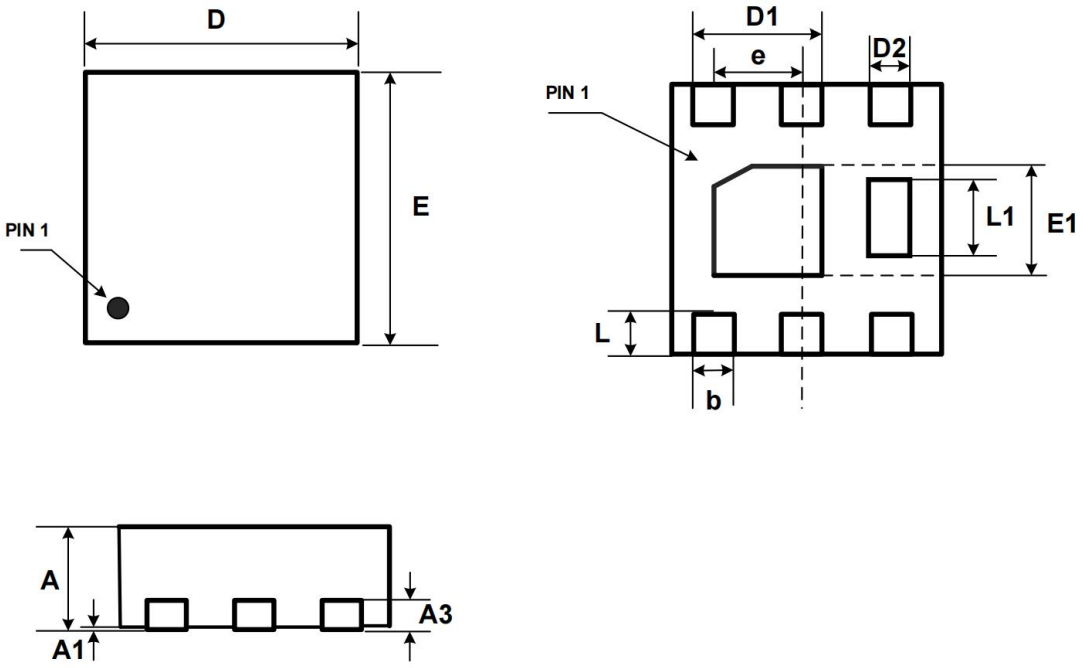
R15N02 = Device code
WWXXXXX= Date code

Packaging SPEC

Part	Package	Marking	Packing method
CT15N02ZF	DFN2020-6L	R15N02	Tape and Reel

Package Outline Dimensions

DFN2020-6L



SYMBOL	MM	
	MIN	MAX
A	0.50	0.60
A1	0.00	0.05
A3	0.152REF	
b	0.25	0.35
D	1.90	2.10
D1	0.80	1.00
E	1.90	2.10
E1	0.80	1.00
L1	0.46	0.66
e	0.65BSC	
D2	0.25	0.35
L	0.25	0.35