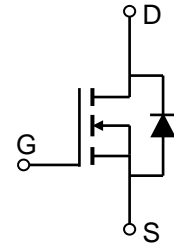
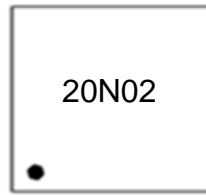
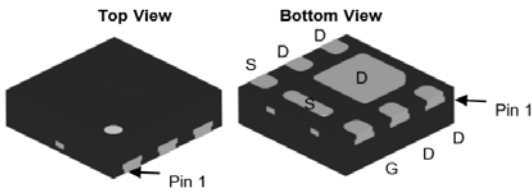


Features

- Advanced Trench Technology
- Excellent RDS(ON) and Low Gate Charge
- Lead Free

Applications

- Load Switch
- PWM Application
- Power Management



DFN2020-6L

Marking and Pin Assignment

Schematic Diagram

Package Marking and Ordering Information

Device Marking	Device	Outline	Package	Reel Size	Reel(pcs)	Per Carton (pcs)
20N02	LXN2020C	TAPING	DFN2020-6L	7"	3000	120000

Absolute Maximum Ratings (@ T_A = 25°C unless otherwise specified)

Symbol	Parameter	Value	Units
V _{DS}	Drain-to-Source Voltage	20	V
V _{GS}	Gate-to-Source Voltage	±12	V
I _D	Continuous Drain Current	T _A = 25°C	20
		T _A = 100°C	12
I _{DM}	Pulsed Drain Current ⁽¹⁾	80	A
E _{AS}	Single Pulsed Avalanche Energy ⁽²⁾	36	mJ
P _D	Power Dissipation	T _A = 25°C	2.7
R _{θJA}	Thermal Resistance, Junction to Ambient ⁽³⁾	46	°C/W
T _J , T _{STG}	Junction & Storage Temperature Range	-55 to 150	°C



Electrical Characteristics ($T_J = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$I_D = 250\mu\text{A}, V_{GS} = 0\text{V}$	20	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 20\text{V}, V_{GS} = 0\text{V}$	-	-	1.0	μA
I_{GSS}	Gate-Body Leakage Current	$V_{DS} = 0\text{V}, V_{GS} = \pm 12\text{V}$	-	-	± 100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	0.5	0.75	1.0	V
$R_{DS(on)}$	Static Drain-Source ON-Resistance ⁽⁴⁾	$V_{GS} = 4.5\text{V}, I_D = 15\text{A}$	-	6.9	9.0	m Ω
		$V_{GS} = 2.5\text{V}, I_D = 10\text{A}$	-	9.0	11.7	m Ω
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{GS} = 0\text{V}, V_{DS} = 10\text{V}, f = 1\text{MHz}$	-	1613	-	pF
C_{oss}	Output Capacitance		-	228	-	pF
C_{rss}	Reverse Transfer Capacitance		-	200	-	pF
Q_g	Total Gate Charge	$V_{GS} = 0 \text{ to } 4.5\text{V}$ $V_{DD} = 10\text{V}, I_D = 10\text{A}$	-	17	-	nC
Q_{gs}	Gate Source Charge		-	4	-	nC
Q_{gd}	Gate Drain("Miller") Charge		-	4.7	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On DelayTime	$V_{GS} = 4.5\text{V}, V_{DD} = 10\text{V}$ $I_D = 10\text{A}, R_{GEN} = 3\Omega$	-	9	-	ns
t_r	Turn-On Rise Time		-	32	-	ns
$t_{d(off)}$	Turn-Off DelayTime		-	37	-	ns
t_f	Turn-Off Fall Time		-	15	-	ns
Drain-Source Diode Characteristics and Max Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	20	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	80	A
V_{SD}	Drain to Source Diode Forward Voltage	$V_{GS} = 0\text{V}, I_S = 20\text{A}$	-	-	1.2	V
t_{rr}	Body Diode Reverse Recovery Time	$I_F = 10\text{A}, di/dt = 100\text{A}/\mu\text{s}$	-	12	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge		-	4.7	-	nC

Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

2. E_{AS} condition: Starting $T_J=25^\circ\text{C}$, $V_{DD}=10\text{V}$, $V_G=10\text{V}$, $R_G=25\text{ohm}$, $L=0.5\text{mH}$, $I_{AS}=12\text{A}$

3. $R_{\theta JA}$ is measured with the device mounted on a 1inch² pad of 2oz copper FR4 PCB

4. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 0.5\%$.

Typical Performance Characteristics

Figure 1: Output Characteristics

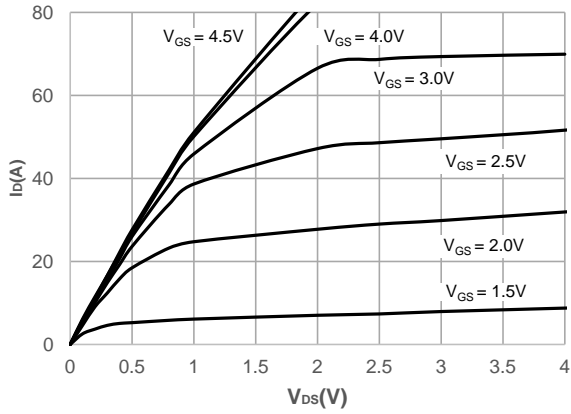


Figure 2: Typical Transfer Characteristics

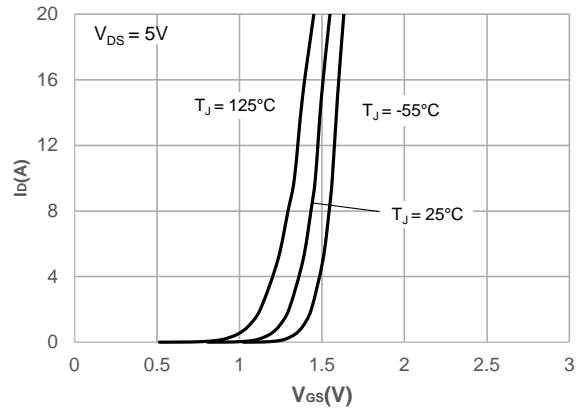


Figure 3: On-resistance vs. Drain Current

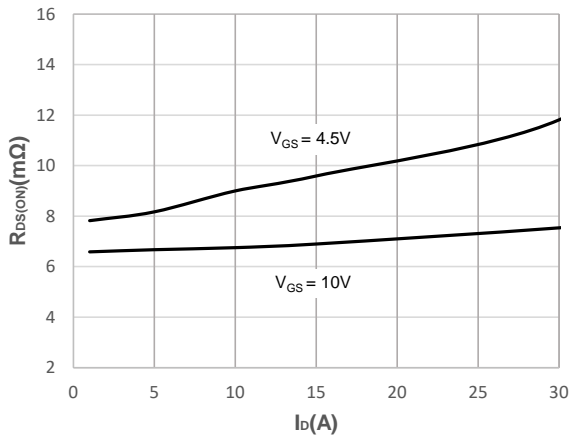


Figure 4: Body Diode Characteristics

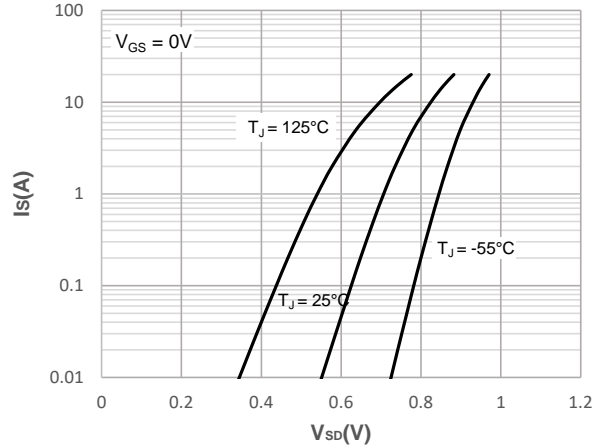


Figure 5: Gate Charge Characteristics

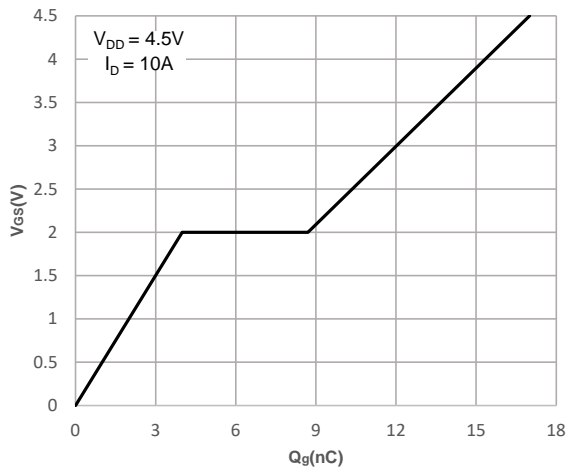
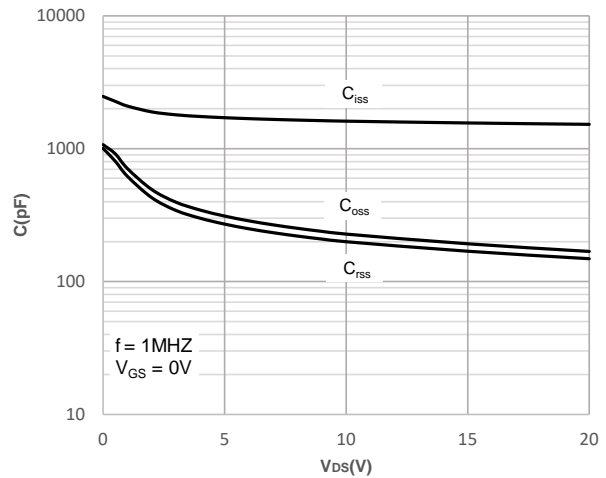


Figure 6: Capacitance Characteristics



Typical Performance Characteristics

Figure 7: Normalized Breakdown voltage vs. Junction Temperature

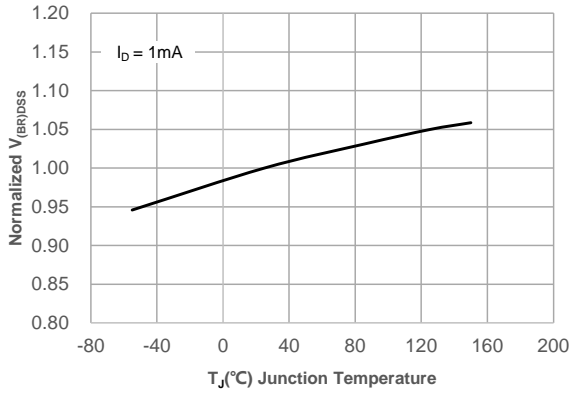


Figure 8: Normalized on Resistance vs. Junction Temperature

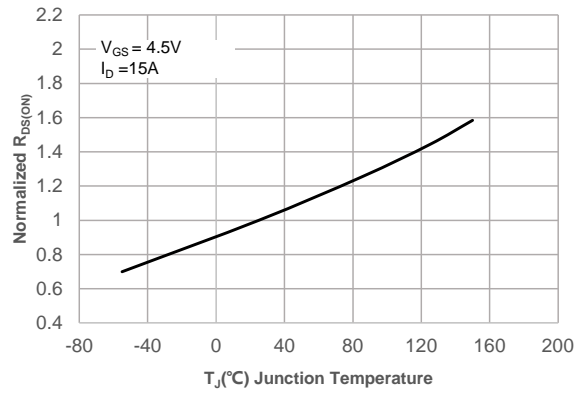


Figure 9: Maximum Safe Operating Area

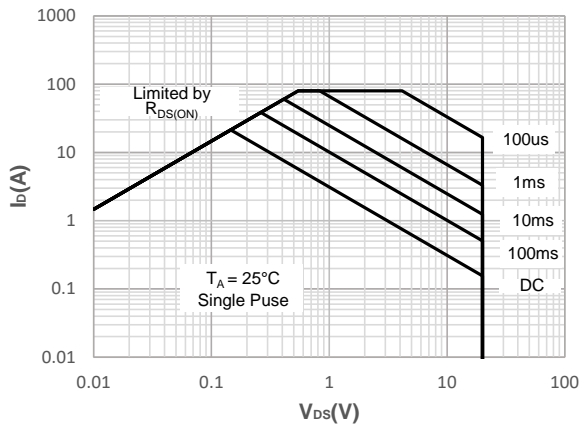


Figure 10: Maximum Continuous Driian Current vs. Ambient Temperature

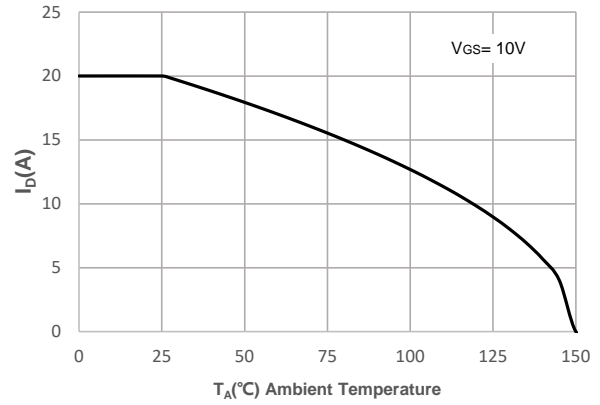


Figure 11: Normalized Maximum Transient Thermal Impedance

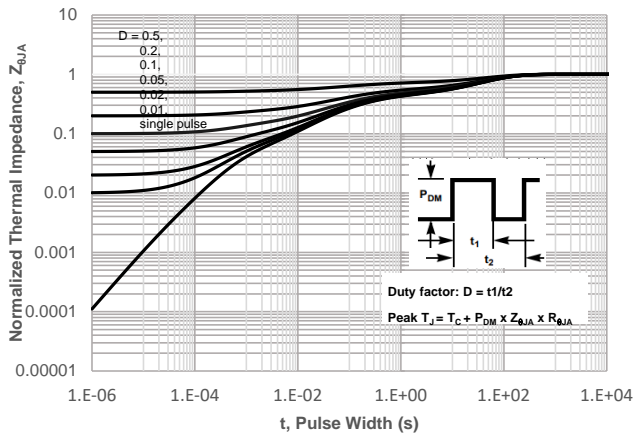
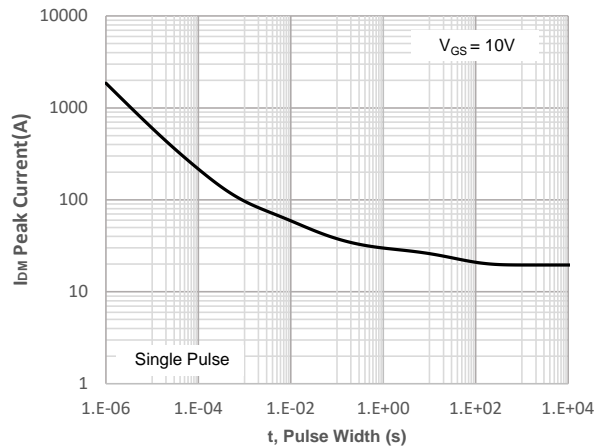


Figure 12: Peak Current Capacity



Test Circuit

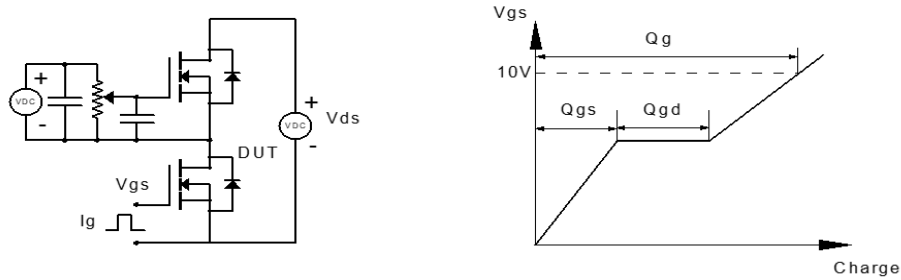


Figure 1: Gate Charge Test Circuit & Waveform

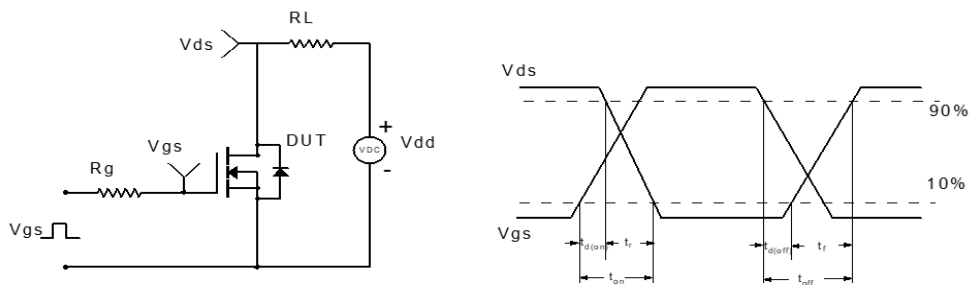


Figure 2: Resistive Switching Test Circuit & Waveform

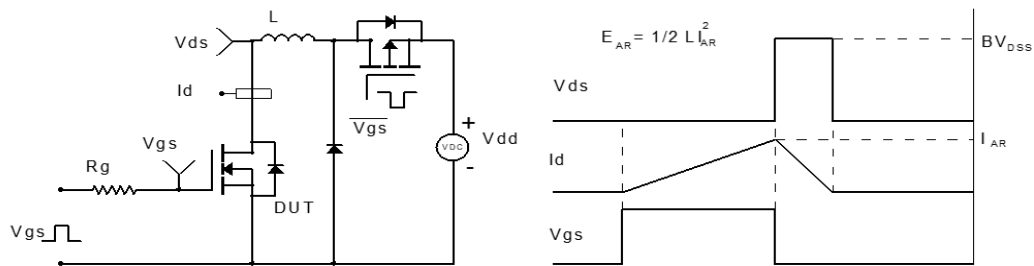


Figure 3: Unclamped Inductive Switching Test Circuit & Waveform

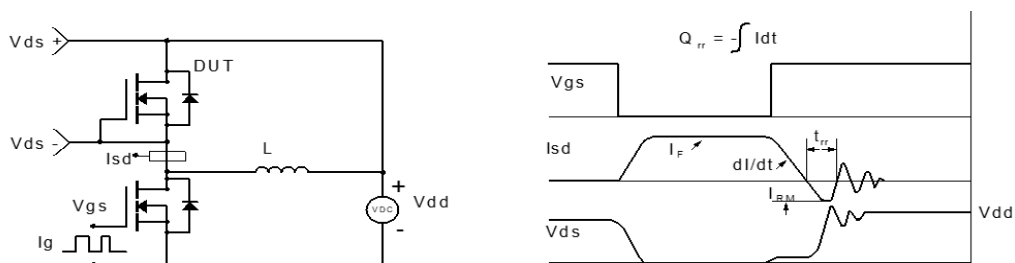
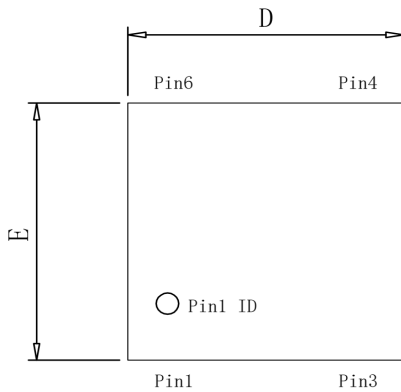


Figure 4: Diode Recovery Test Circuit & Waveform

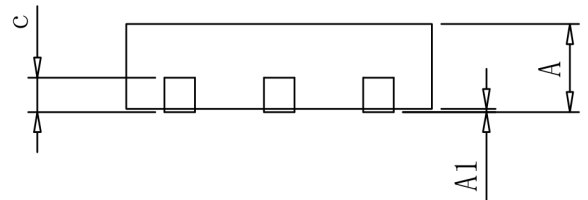
Package Mechanical Data(DFN2020-6L)



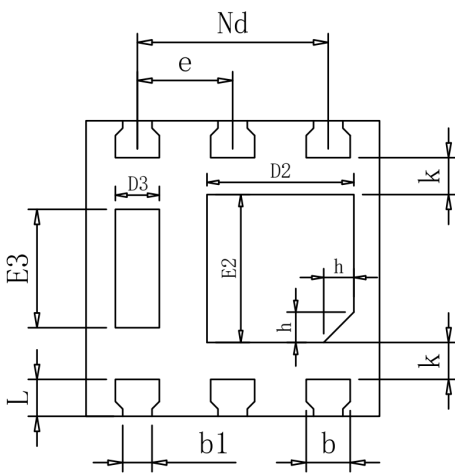
Top View



Side View



Side View



Bottom View

SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	0.50	0.55	0.60
A1	--	0.02	0.05
b	0.25	0.30	0.35
b1	0.15	0.20	0.25
c	0.203 REF		
D	1.90	2.00	2.10
D2	0.90	1.00	1.10
D3	0.20	0.30	0.40
Nd	1.30 BSC		
e	0.65 BSC		
E	1.90	2.00	2.10
E2	0.90	1.00	1.10
E3	0.70	0.80	0.90
h	0.155	0.205	0.255
k	0.20	0.25	0.30
L	0.20	0.25	0.30