GPT076N20NTD

200V N-Channel MOSFET

GP ELECTRONICS

Product Summary
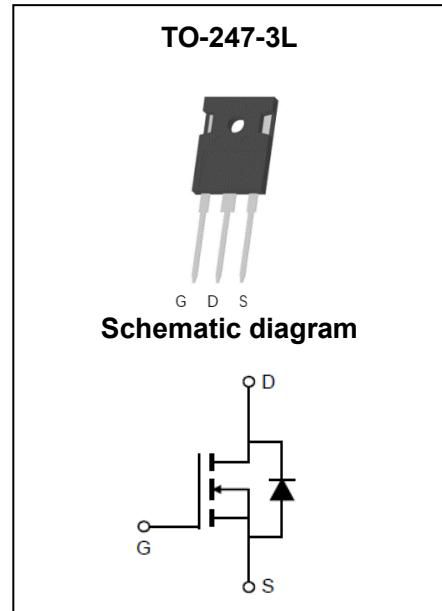
$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
200V	6.9mΩ@10V	125A

Feature
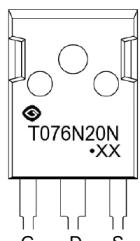
- Split Gate Trench Technology
- Low $R_{DS(ON)}$
- Low Gate Charge
- Low Gate Resistance
- 100% UIS Tested

Application

- DC/DC Converter
- Power Switching Application
- Motor Control

TO-247-3L

G D S

Schematic diagram

MARKING:

T076N20N = Device Code

XX = Date Code

Solid Dot = Green Indicater

T076N20N
•XX

G   D   S

ABSOLUTE MAXIMUM RATINGS (T_A = 25℃ unless otherwise noted)
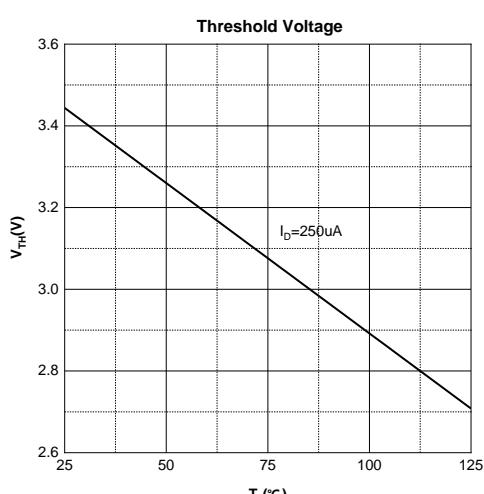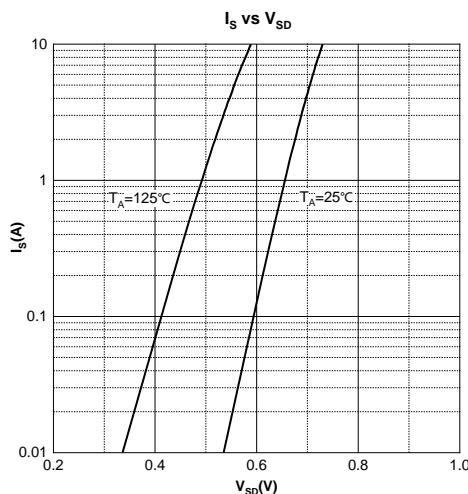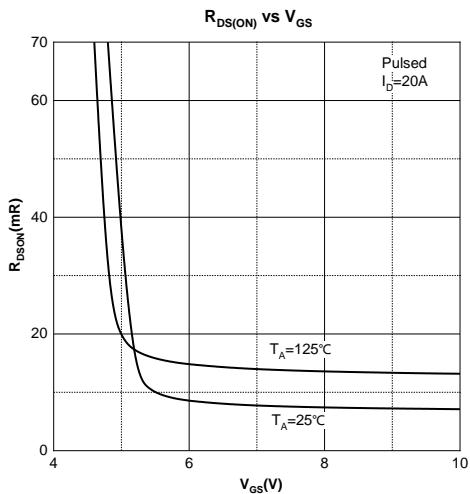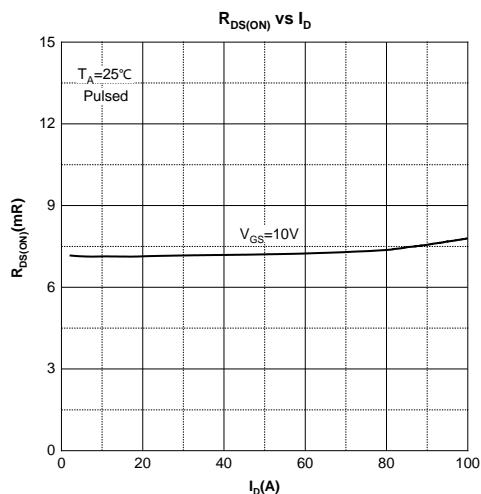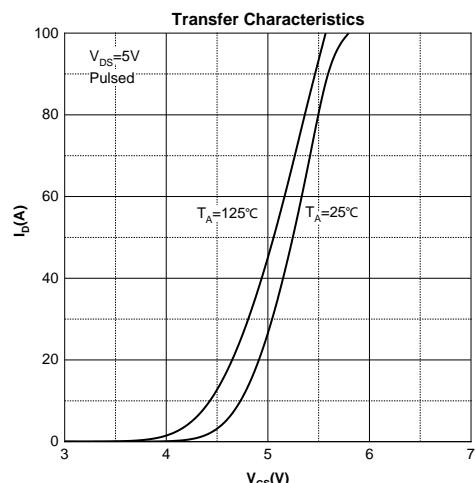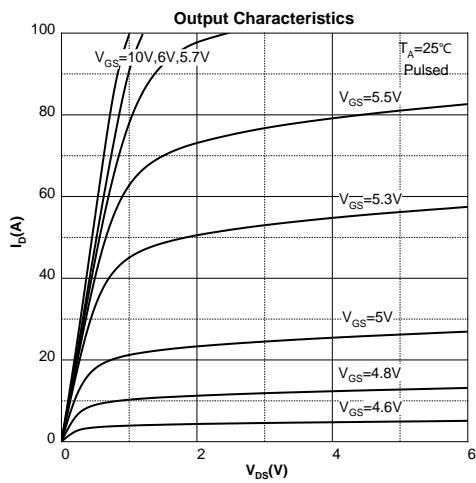
Parameter		Symbol	Value	Unit
Drain - Source Voltage		V_{DS}	200	V
Gate - Source Voltage		V_{GS}	±20	V
Continuous Drain Current[1]	T_C = 25℃	I_D	125	A
	T_C = 100℃	I_D	81	A
Pulsed Drain Current[2]		I_{DM}	500	A
Single Pulsed Avalanche Current[3]		I_{AS}	93	A
Single Pulsed Avalanche Energy[3]		E_{AS}	2162	mJ
Power Dissipation[5]	T_C = 25℃	P_D	284	W
Thermal Resistance from Junction to Ambient[6]		$R_{\theta JA}$	52	℃/W
Thermal Resistance from Junction to Case		$R_{\theta JC}$	0.44	℃/W
Junction Temperature		T_J	150	℃
Storage Temperature		T_{STG}	-55~ +150	℃
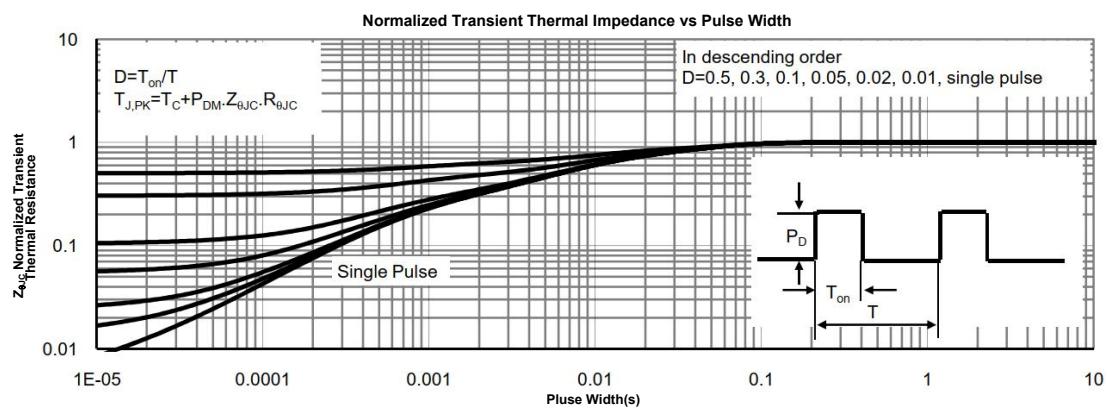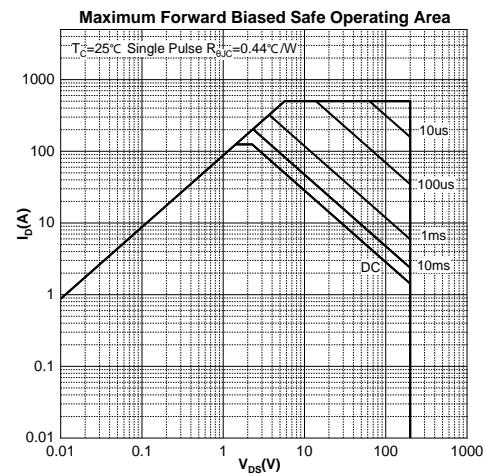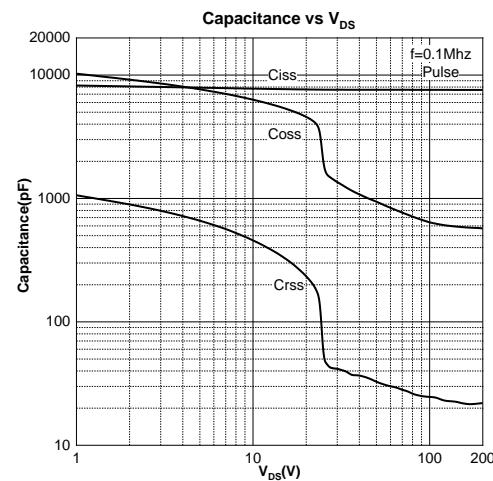
MOSFET ELECTRICAL CHARACTERISTICS (T_A = 25℃ unless otherwise noted)
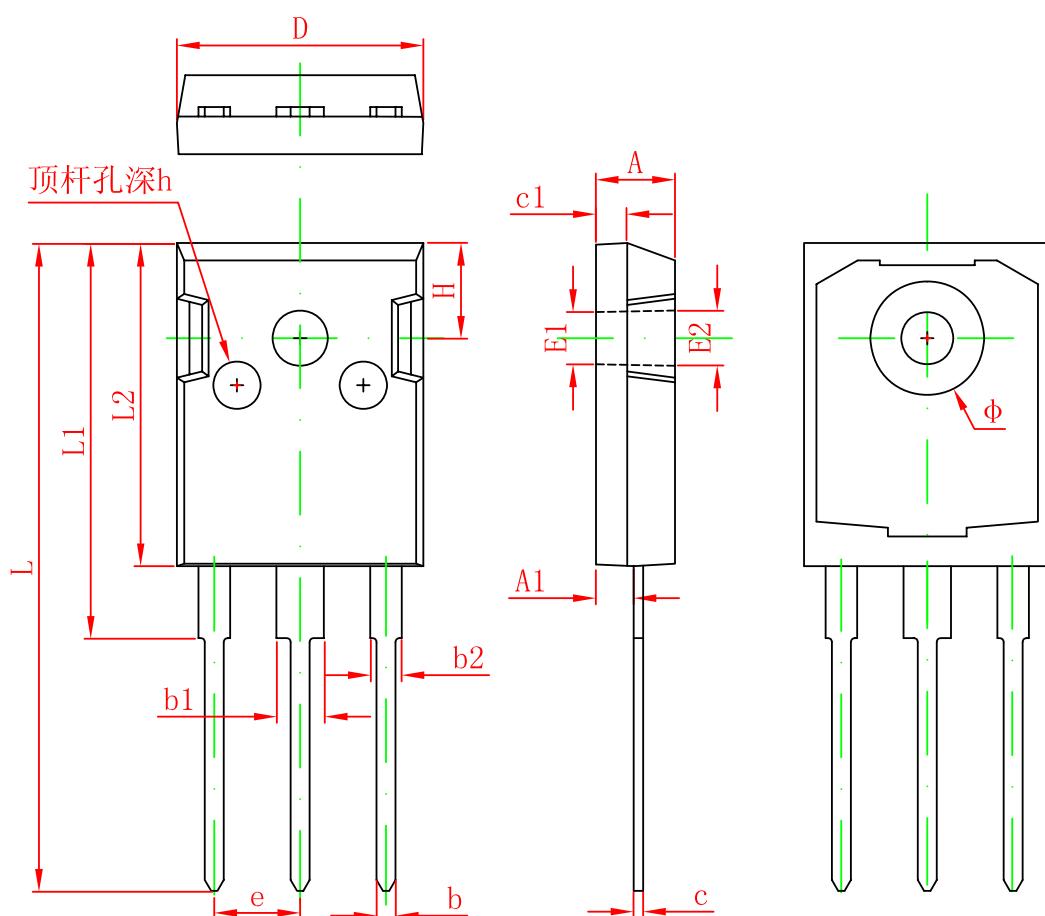
| Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Off Characteristics						
Drain - Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250µA	200			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 200V, V_{GS} = 0V			1	µA
Gate - Body Leakage Current	I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V			±100	nA
On Characteristics[4]						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250µA	2.5	3.4	4.5	V
Drain-source On-resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 20A		6.9	8.8	mΩ
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS} = 100V, V_{GS} = 0V, f = 0.1MHz		7614		pF
Output Capacitance	C_{oss}			639		
Reverse Transfer Capacitance	C_{rss}			28		
Gate Resistance	R_g	V_{DS} = 0V, V_{GS} = 0V, f = 0.1MHz		1.9		Ω
Switching Characteristics						
Total Gate Charge	Q_g	V_{DS} = 100V, V_{GS} = 10V, I_D = 20A		109		nC
Gate-source Charge	Q_{gs}			37		
Gate-drain Charge	Q_{gd}			24		
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = 100V, V_{GS} = 10V, I_D = 20A, R_G = 4.7Ω		53		ns
Turn-on Rise Time	t_r			35		
Turn-off Delay Time	$t_{d(off)}$			62		
Turn-off Fall Time	t_f			14		
Source - Drain Diode Characteristics						
Diode Forward Voltage[4]	V_{SD}	V_{GS} = 0V, I_S = 20A			1.2	V

Notes :

1.The maximum current rating is limited by package.And device mounted on a large heatsink

2.Pulse Test : Pulse Width ≤ 10µs, duty cycle ≤ 1%.

3.E_{AS} condition: V_{DD} = 100V,V_{GS} = 10V, L = 0.5mH, R_G = 25Ω Starting T_J = 25°℃.

4.Pulse Test : Pulse Width ≤ 300µs, duty cycle ≤ 2%.

5.The power dissipation P_D is limited by $T_{J(MAX)}$ = 150°C.And device mounted on a large heatsink

6.Device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C.

Typical Characteristics

Output Characteristics

V_{GS}=10V,6V,5.7V

T_A=25℃
Pulsed

V_{GS}=5.5V

V_{GS}=5.3V

V_{GS}=5V

V_{GS}=4.8V

V_{GS}=4.6V

I_D(A) vs V_{DS}(V)

Transfer Characteristics

V_{DS}=5V
Pulsed

T_A=125℃ T_A=25℃

I_D(A) vs V_{GS}(V)

$R_{DS(ON)}$ vs I_D

T_A=25℃
Pulsed

V_{GS}=10V

$R_{DS(ON)}$(mR) vs I_D(A)

$R_{DS(ON)}$ vs V_{GS}

Pulsed
I_D=20A

T_A=125℃

T_A=25℃

R_{DSON}(mR) vs V_{GS}(V)

I_S vs V_{SD}

T_A=125℃ T_A=25℃

I_S(A) vs V_{SD}(V)

Threshold Voltage

I_D=250uA

V_{TH}(V) vs T_J(℃)

Capacitance vs V_{DS}

Maximum Forward Biased Safe Operating Area

Normalized Transient Thermal Impedance vs Pulse Width

$D = T_{on}/T$

$T_{J,PK} = T_C + P_{DM} \cdot Z_{\theta JC} \cdot R_{\theta JC}$

In descending order
D=0.5, 0.3, 0.1, 0.05, 0.02, 0.01, single pulse

Single Pulse

TO-247-3L Package Information

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Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.850	5.150	0.191	0.200
A1	2.200	2.600	0.087	0.102
b	1.000	1.400	0.039	0.055
b1	2.800	3.200	0.110	0.126
b2	1.800	2.200	0.071	0.087
c	0.500	0.700	0.020	0.028
c1	1.900	2.100	0.075	0.083
D	15.450	15.750	0.608	0.620
E1	3.500 REF		0.138 REF	
E2	3.600 REF		0.142 REF	
L	40.900	41.300	1.610	1.626
L1	24.800	25.100	0.976	0.988
L2	20.300	20.600	0.799	0.811
Φ	7.100	7.300	0.280	0.287
e	5.450 TYP		0.215 TYP	
H	5.980 REF		0.235 REF	
h	0.000	0.300	0.000	0.012