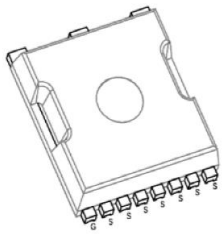
GPT016N06NTP

60V N-Channel MOSFET

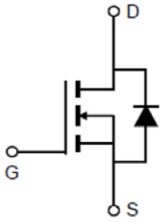
Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
60V	1.3mΩ@10V	300A

TOLL



Schematic diagram



Feature

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

Application

- Power Management
- Load Switching

Package Marking and Ordering Information

Part Number	Package	Marking	Packing	Reel Size	Tape Width	Qty
GPT016N06NTP	TOLL	T016N06N	Reel & Tape	330mm	24mm	2000pcs

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current[1]	T_C = 25°C	I_D	300	A
	T_C = 100°C		190	
Pulsed Drain Current[2]		I_{DM}	1200	A
Single Pulsed Avalanche Current[3]		I_{AS}	63	A
Single Pulsed Avalanche Energy[3]		E_{AS}	992	mJ
Power Dissipation[5]	T_C = 25°C	P_D	312	W
Thermal Resistance from Junction to Ambient[6]		$R_{\theta JA}$	30	°C/W
Thermal Resistance from Junction to Case		$R_{\theta JC}$	0.4	°C/W
Junction Temperature		T_J	150	°C
Storage Temperature		T_{STG}	-55~ +150	°C

MOSFET ELECTRICAL CHARACTERISTICS (T_A = 25°C 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	60			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 60V, 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	1.5	2.3	3.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 20A		1.3	1.7	mΩ
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS} = 30V, V_{GS} = 0V, f = 1MHz		4528		pF
Output Capacitance	C_{oss}			1220		
Reverse Transfer Capacitance	C_{rss}			76		
Gate Resistance	R_g	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz		2.7		Ω
Switching Characteristics						
Total Gate Charge	Q_g	V_{DS} = 35V, V_{GS} = 10V, I_D = 20A		88		nC
Gate-Source Charge	Q_{gs}			16		
Gate-Drain Charge	Q_{gd}			26		
Gate Plateau Voltage	$V_{plateau}$			3.7		V
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 30V, V_{GS} = 10V, R_G = 2.2Ω,I_D = 150A		27		ns
Turn-On Rise Time	t_r			261		
Turn-Off Delay Time	$t_{d(off)}$			48		
Turn-Off Fall Time	t_f			13		
Source-Drain Diode Characteristics						
Diode Forward Voltage[4]	V_{SD}	V_{GS} = 0V, I_S = 10A			1.2	V
Diode Continuous Forward Current[1]	I_S	T_C = 25°C			300	A
Diode Pulse Forward Current[2]	I_{SM}				1200	A
Diode Reverse Recovery Time	t_{rr}	I_F = 150A, dI/dt = 100A/μs		80		ns
Diode Reverse Recovery Charge	Q_{rr}			208		nC

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%.

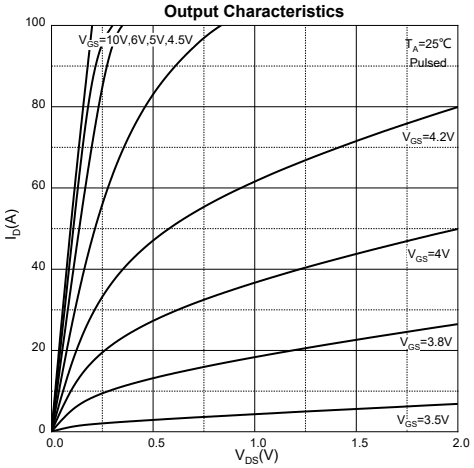
3.E_{AS} condition: V_{DD} = 40V, V_{GS} = 10V, L = 0.5mH, R_G = 25Ω Starting T_J = 25°C.

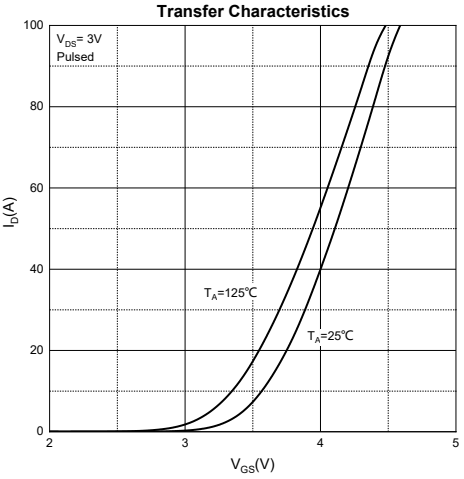
4.Pulse Test: Pulse Width ≤ 300μs, duty cycle ≤ 2%.

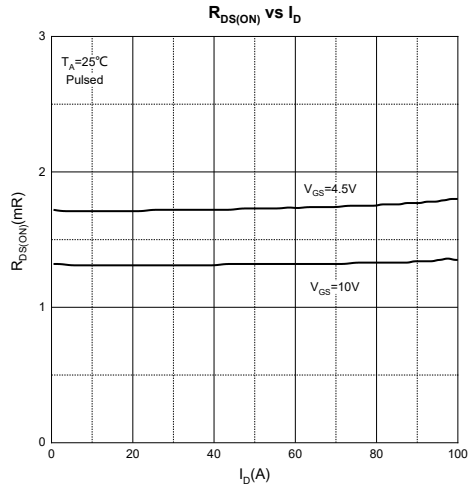
5.The power dissipation P_D is limited by $T_{J(MAX)}$ = 150°C. And device mounted on a large heatsink.

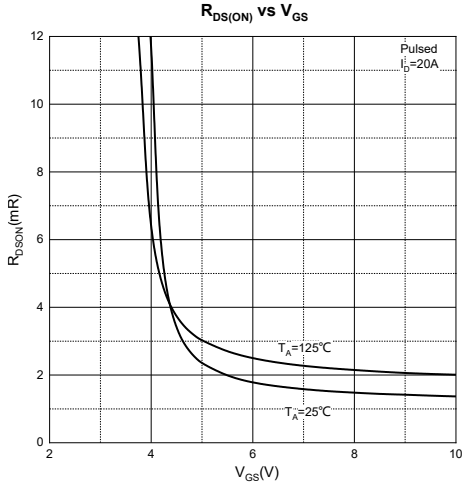
6.Device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A = 25°C.

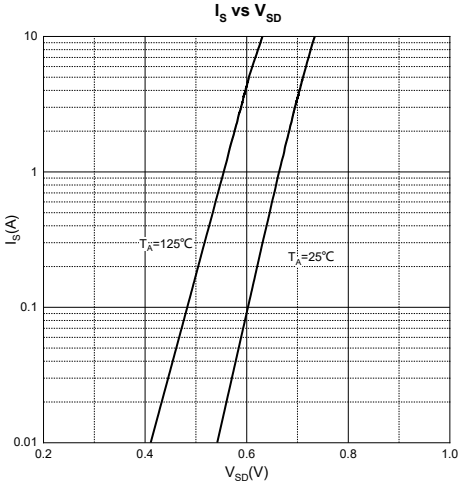
Typical Characteristics

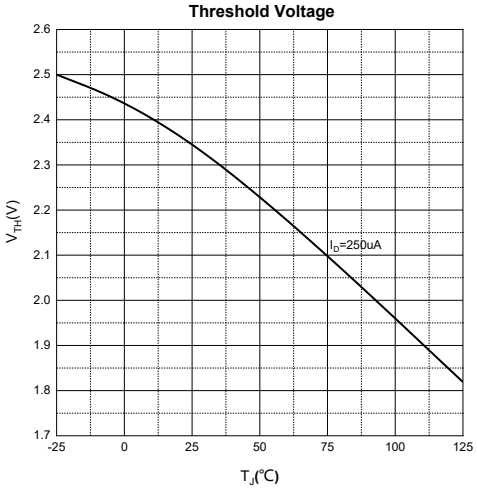


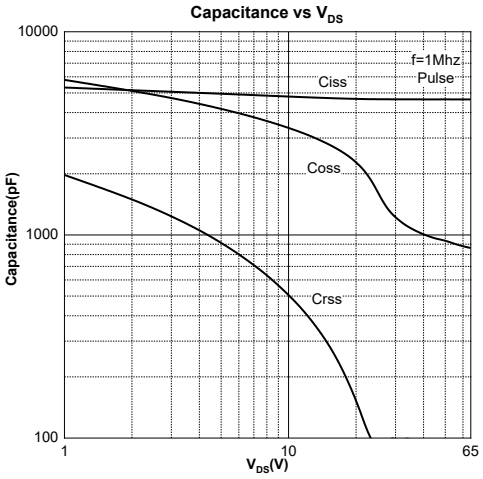


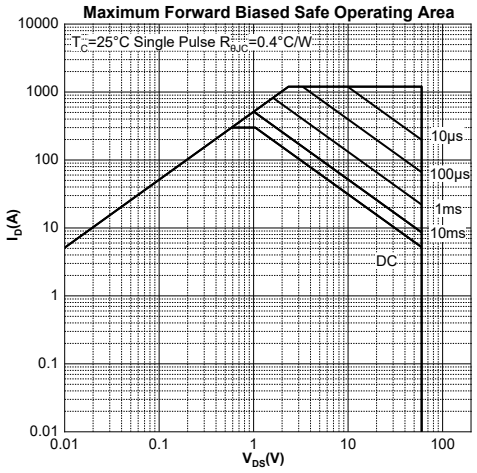


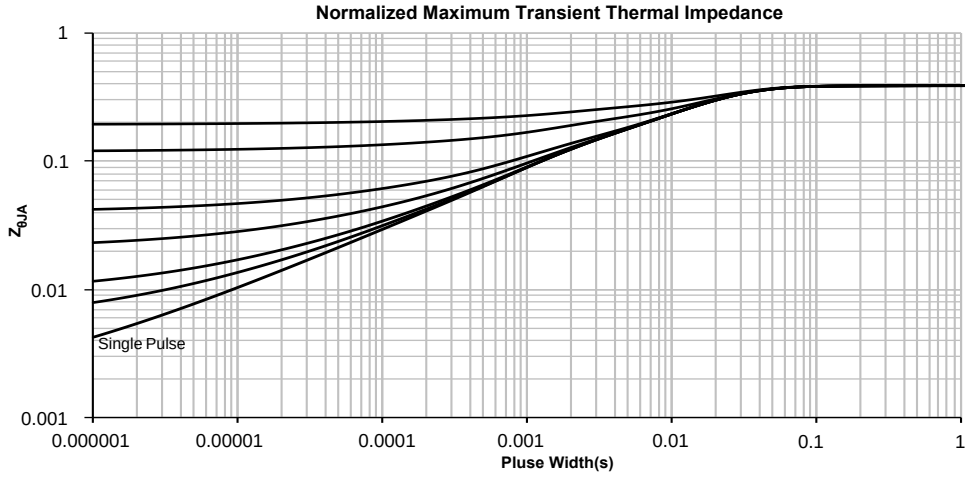




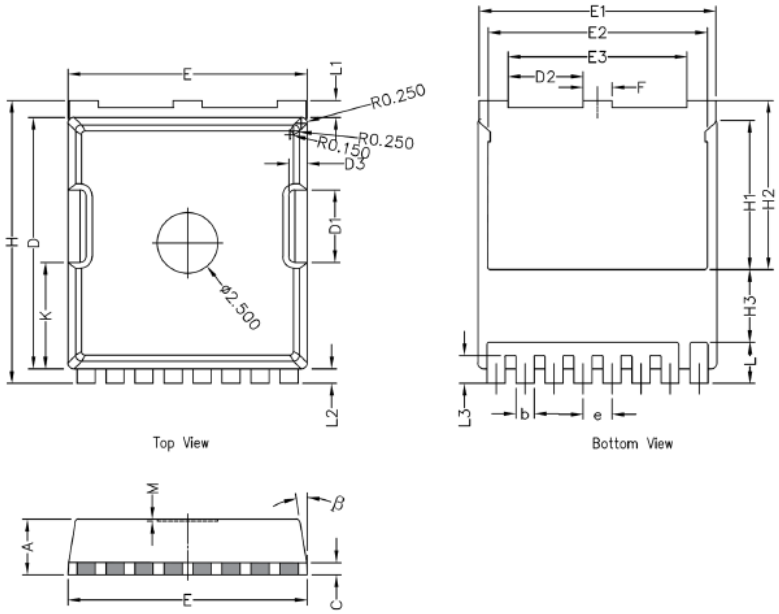



Capacitance vs V_{DS}
10000
1000
100
Capacitance(pF)
f=1Mhz
Pulse
Ciss
Coss
Crss
1
10
65
V_{DS}(V)


Maximum Forward Biased Safe Operating Area
T_C=25°C Single Pulse $R_{\theta JC}$=0.4°C/W
10000
1000
100
10
1
0.1
0.01
I_D(A)
10μs
100μs
1ms
10ms
DC
0.01
0.1
1
10
100
V_{DS}(V)


Normalized Maximum Transient Thermal Impedance
1
0.1
0.01
0.001
$Z_{\theta JA}$
Single Pulse
0.000001
0.00001
0.0001
0.001
0.01
0.1
1
Pluse Width(s)

TOLL Package Information



SYMBOL	MILLIMETER		Dimensions In Inches	
	MIN.	MAX.	Min.	Max.
A	2.200	2.400	0.087	0.094
b	0.650	0.850	0.026	0.033
C	0.508REF		0.020 REF	
D	10.250	10.550	0.404	0.415
D1	2.850	3.150	0.112	0.124
D2	2.950	3.250	0.116	0.128
D3	0.750 REF		0.030 REF	
E	9.750	10.050	0.384	0.396
E1	9.650	9.950	0.380	0.392
E2	8.950	9.250	0.352	0.364
E3	7.250	7.550	0.285	0.297
e	1.200BSC		0.047 BSC	
F	1.050	1.350	0.041	0.053
H	11.550	11.850	0.455	0.467
H1	6.030	6.330	0.237	0.249
H2	6.850	7.150	0.270	0.281
H3	3.000 BSC		0.118 BSC	
L	1.550	1.850	0.061	0.073
L1	0.550	0.850	0.022	0.033
L2	0.450	0.750	0.018	0.030
L3	1.000	1.300	0.039	0.051
M	0.080 REF		0.003 REF	
β	8°	12°	8°	12°
K	4.250	4.550	0.167	0.179

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