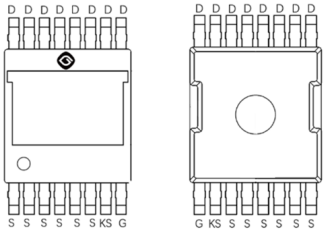
GPT013N10NTU

100V N-Channel MOSFET

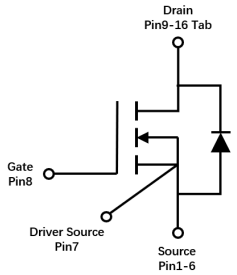
Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
100V	1.2mΩ@10V	410A

TOLT



Schematic diagram



Feature

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

Application

- Power Switching Application
- Motor Driving

Package Marking and Ordering Information

Part Number	Package	Marking	Packing	Reel Size	Tape Width	Qty
GPT013N10NTU	TOLT	T013N10N	Reel & Tape	330mm	NA	1200pcs

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

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current[1]	T_C = 25°C	I_D	410	A
	T_C = 100°C	I_D	254	A
Pulsed Drain Current[2]		I_{DM}	1640	A
Single Pulsed Avalanche Current[3]		I_{AS}	95	A
Single Pulsed Avalanche Energy[3]		E_{AS}	2256	mJ
Power Dissipation[5]	T_C = 25°C	P_D	500	W
Thermal Resistance from Junction to Ambient[6]		$R_{\theta JA}$	35	°C/W
Thermal Resistance from Junction to Case		$R_{\theta JC}$	0.2	°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	100			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 100V, 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	3.1	4	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 20A		1.2	1.6	mΩ
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS} = 50V, V_{GS} = 0V, f = 0.1MHz		12198		pF
Output Capacitance	C_{oss}			4312		
Reverse Transfer Capacitance	C_{rss}			95		
Gate Resistance	R_g	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz		3.1		Ω
Switching Characteristics						
Total Gate Charge	Q_g	V_{DS} = 50V, V_{GS} = 10V, I_D = 20A		163		nC
Gate-Source Charge	Q_{gs}			56		
Gate-Drain Charge	Q_{gd}			27		
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 20V, V_{GS} = 10V, R_L= 1Ω, R_G = 3Ω		47		ns
Turn-On Rise Time	t_r			75		
Turn-Off Delay Time	$t_{d(off)}$			116		
Turn-Off Fall Time	t_f			85		
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%.

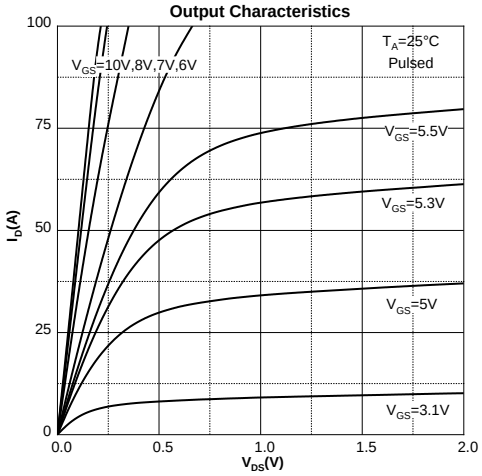
3.E_{AS} condition: V_{DD} = 50V, V_{GS} = 10V, L = 0.5mH, R_G = 25Ω Starting T_J = 25°C.

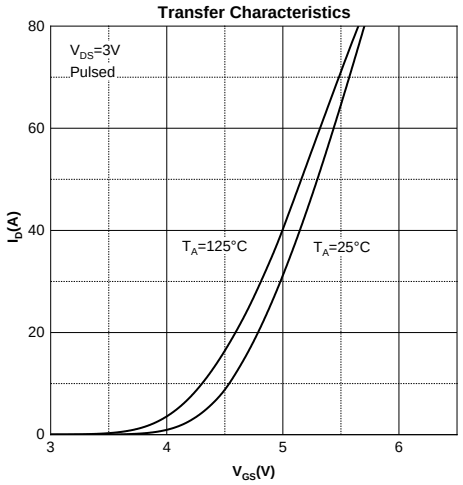
4.Pulse Test : Pulse Width ≤ 300μs, duty cycle ≤ 2%.

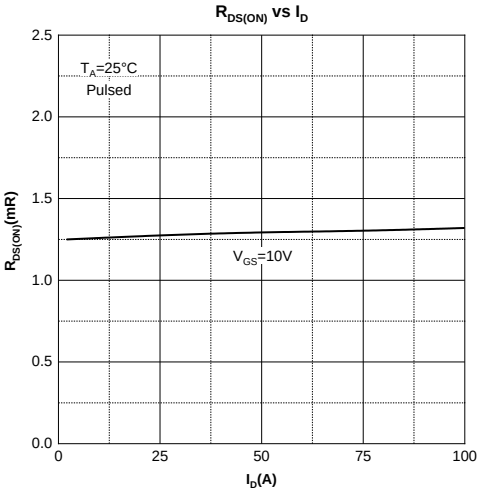
5.The power dissipation P_D is limited by $T_{J(MAX)}$ = 150°C.And device mounted on a large heatsink

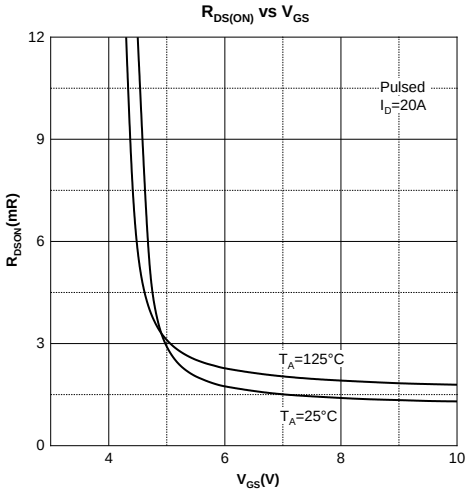
6.Device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C.

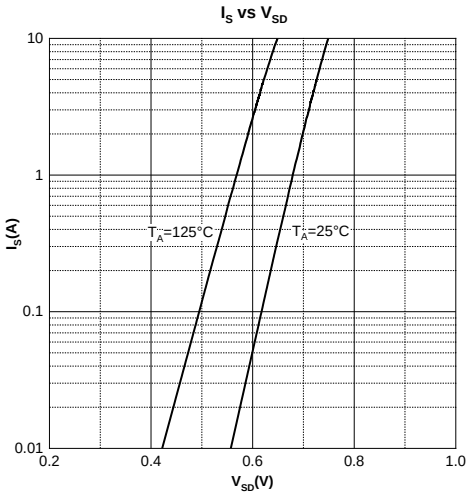
Typical Characteristics

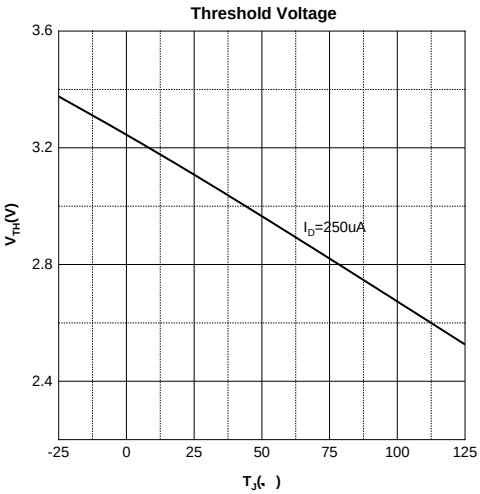


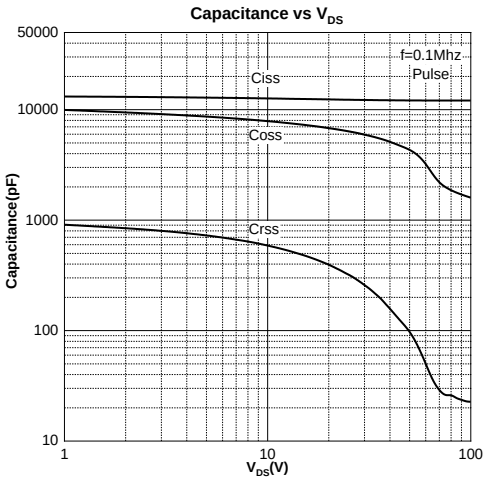


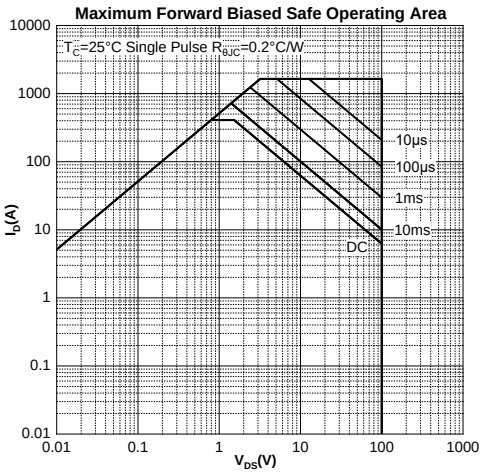


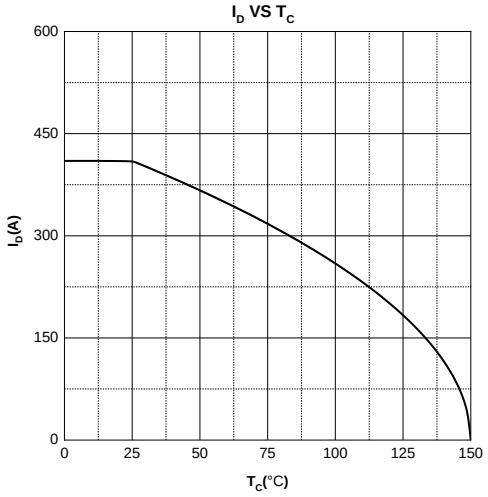


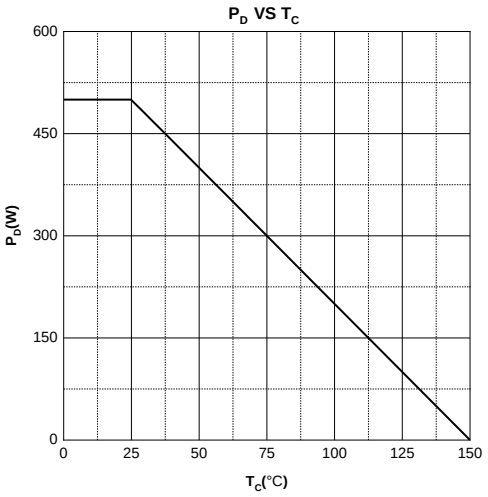


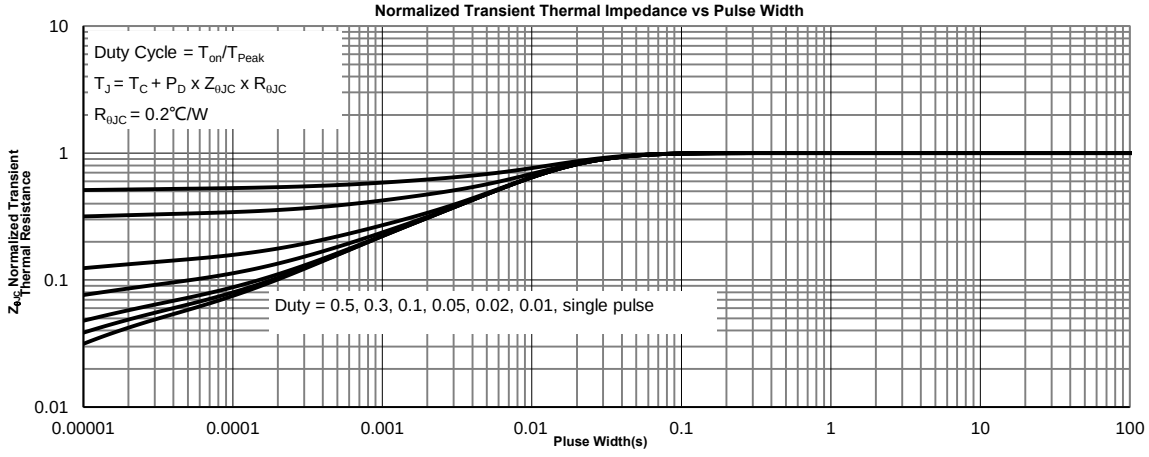



Capacitance vs V_{DS}
f=0.1Mhz
Pulse
Ciss
Coss
Crss
Capacitance(pF)
V_{DS}(V)


Maximum Forward Biased Safe Operating Area
T_C=25°C Single Pulse $R_{\theta JC}$=0.2°C/W
10μs
100μs
1ms
10ms
DC
I_D(A)
V_{DS}(V)

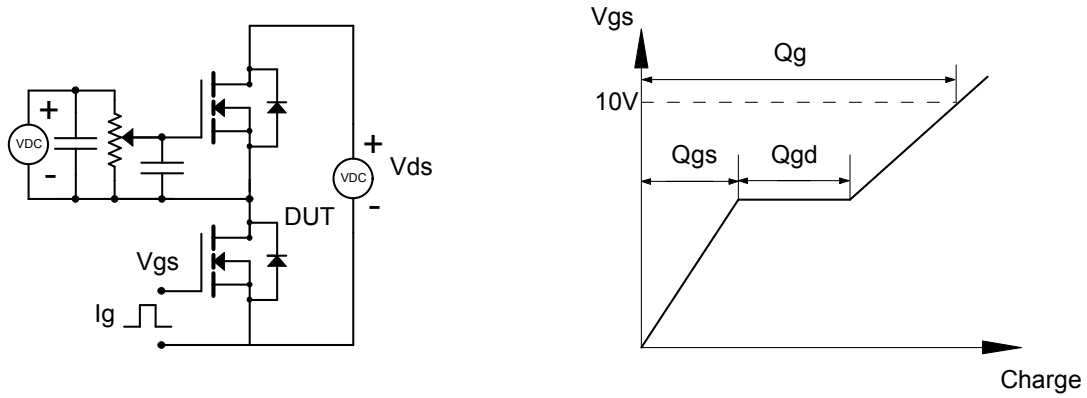

I_D VS T_C
I_D(A)
T_C(°C)


P_D VS T_C
P_D(W)
T_C(°C)

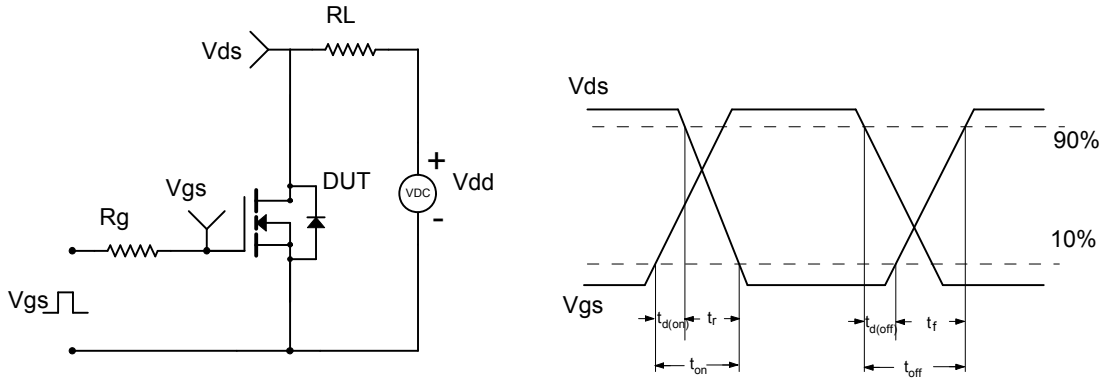

Normalized Transient Thermal Impedance vs Pulse Width
Duty Cycle = T_{on}/T_{Peak}
$T_J = T_C + P_D \times Z_{\theta JC} \times R_{\theta JC}$
$R_{\theta JC}$ = 0.2℃/W
Duty = 0.5, 0.3, 0.1, 0.05, 0.02, 0.01, single pulse
$Z_{\theta JC}$ Normalized Transient Thermal Resistance
Pluse Width(s)

Test Circuit

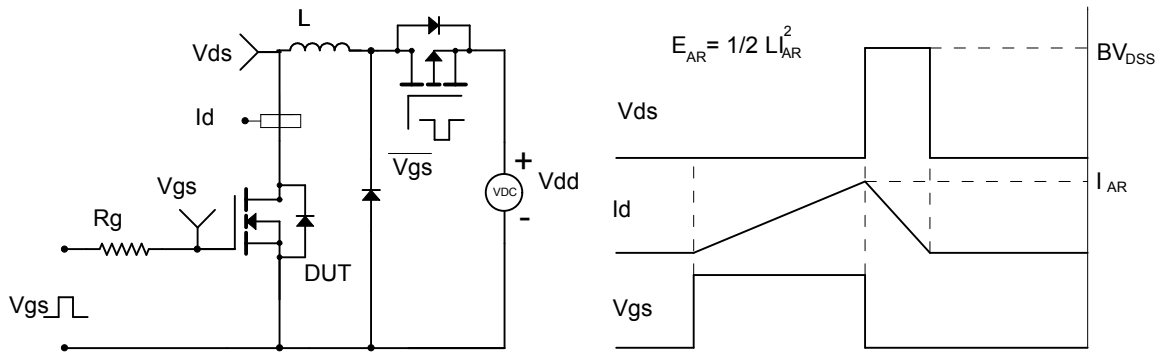
Gate Charge Test Circuit & Waveform



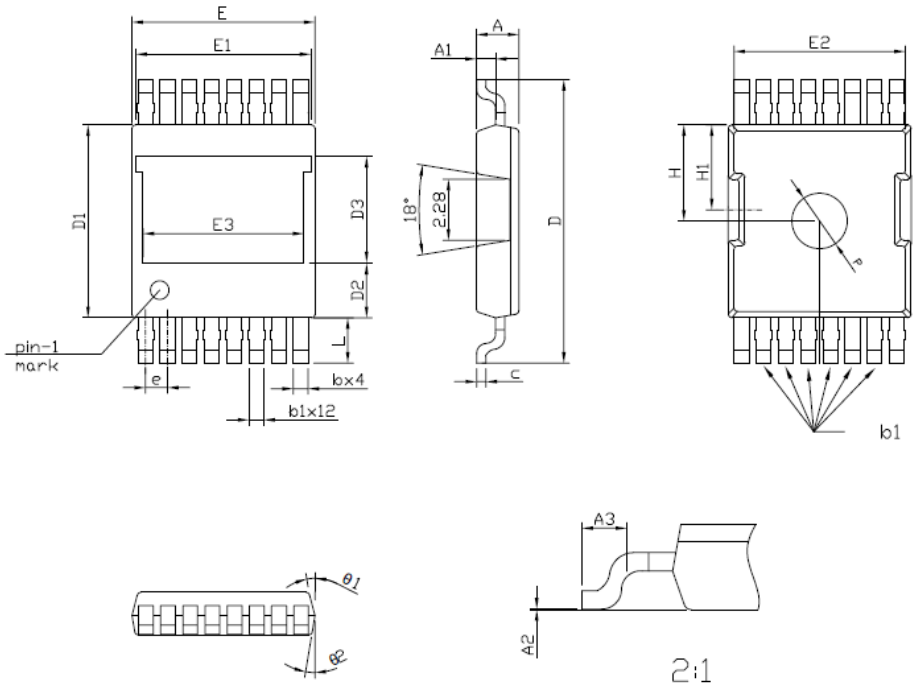
Resistive Switching Test Circuit & Waveform



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



TOLT Package Information



SYMBOL	mm		
	MIN	NOM	MAX
*A	2.25	2.30	2.35
*A1	1.00	1.04	1.08
*A2	0.01	0.08	0.16
A3		1.50REF	
*b	0.73	0.75	0.79
*b1	0.68	0.70	0.74
*c	0.45	0.50	0.55
*D	14.80	15.00	15.20
*D1	10.00	10.10	10.30
D2	2.60	2.80	3.00
D3		5.77REF	
*E	9.70	9.90	10.10
E1		9.46REF	
E2		9.25REF	
E3		8.70REF	
*e	1.18	1.20	1.22
*H	5.00	5.20	5.40
H1	4.40	4.60	4.80
*L	2.40	2.45	2.50
*P	2.80	3.00	3.20
θ1	7°	-	9°
θ2	7°	-	9°

Attention：

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