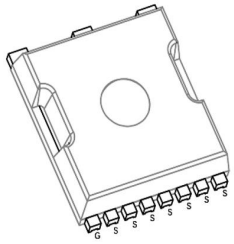
GPT040NE8NTPL

85V N-Channel MOSFET

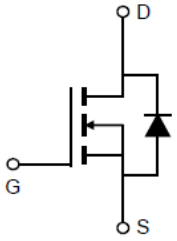
Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
85V	4mΩ@10V	125A

TOLL



Schematic diagram



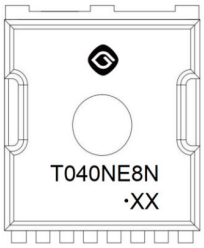
Feature

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

Application

- Power Switching Application

MARKING:



T040NE8N = Device Code

XX = Date Code

Solid Dot = Green Indicater

ABSOLUTE MAXIMUM RATINGS (T_A = 25℃ unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain - Source Voltage		V_{DS}	85	V
Gate - Source Voltage		V_{GS}	±20	V
Continuous Drain Current[1]	T_C = 25℃	I_D	125	A
	T_C = 100℃	I_D	88	A
Pulsed Drain Current[2]		I_{DM}	500	A
Single Pulsed Avalanche Current[3]		I_{AS}	53	A
Single Pulsed Avalanche Energy[3]		E_{AS}	702	mJ
Power Dissipation[5]	T_C = 25℃	P_D	329	W
Thermal Resistance from Junction to Ambient[6]		$R_{\theta JA}$	45	℃/W
Thermal Resistance from Junction to Case		$R_{\theta JC}$	0.38	℃/W
Junction Temperature		T_J	150	℃
Storage Temperature		T_{STG}	-55~ +150	℃

MOSFET ELECTRICAL CHARACTERISTICS (T_J = 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	85			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 85V, 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	4	V
Drain-source On-resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 20A		4	5.2	mΩ
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS} = 45V, V_{GS} = 0V, f = 1MHz		4342		pF
Output Capacitance	C_{oss}			638		
Reverse Transfer Capacitance	C_{rss}			23		
Gate Resistance	R_g	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz		1.5		Ω
Switching Characteristics						
Total Gate Charge	Q_g	V_{DS} = 45V, V_{GS} = 10V, I_D = 20A		80		nC
Gate-source Charge	Q_{gs}			18.4		
Gate-drain Charge	Q_{gd}			25.8		
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = 40V, V_{GS} = 10V, I_D= 20A, R_G = 3Ω		17		ns
Turn-on Rise Time	t_r			52		
Turn-off Delay Ttime	$t_{d(off)}$			21		
Turn-off Fall Time	t_f			11		
Source - Drain Diode Characteristics						
Diode Forward Voltage[4]	V_{SD}	V_{GS} = 0V, I_S = 20A			1.2	V
Diode Reverse Recovery Time	t_{rr}	I_F = 20A, dI/dt = 100A/μs		67		ns
Diode Reverse Recovery Charge	Q_{rr}			139		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%.

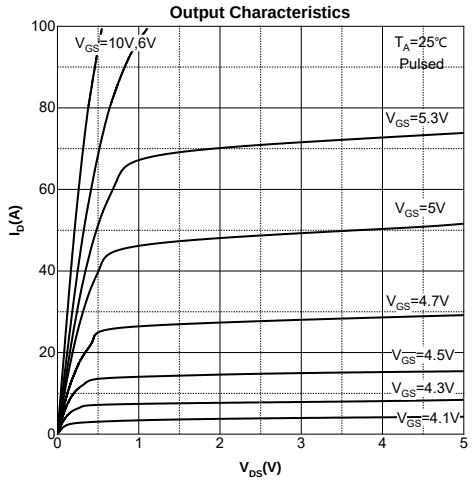
3.E_{AS} condition: V_{DD} = 50V,V_{GS} = 10V, L = 0.5mH, R_G = 25Ω Starting T_J = 25°℃.

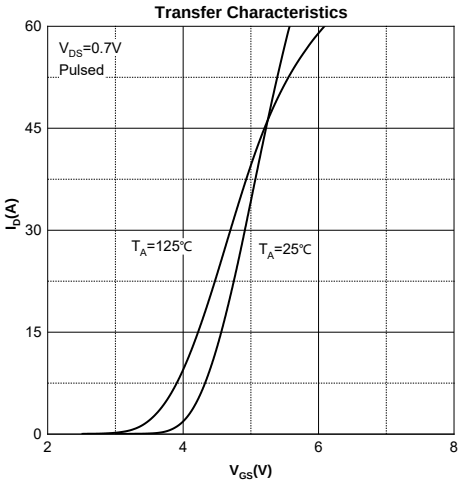
4.Pulse Test : Pulse Width ≤ 300μs, duty cycle ≤ 2%.

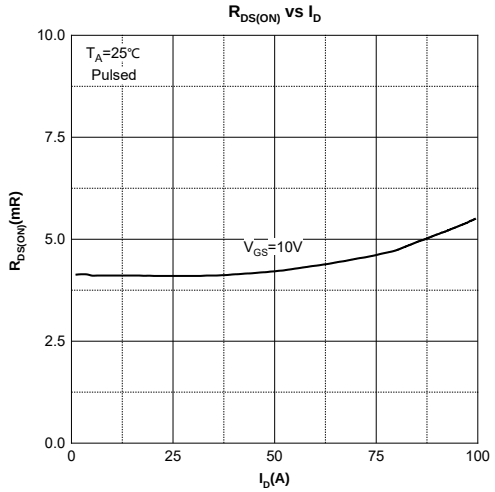
5.The power dissipation P_D is limited by $T_{J(MAX)}$ = 150°C.And device mounted on a large heatsink

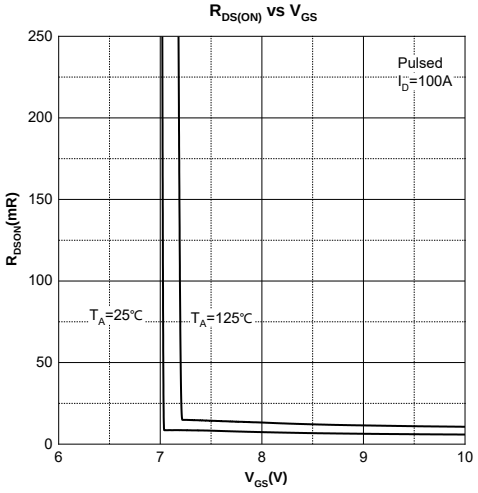
6.Device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C.

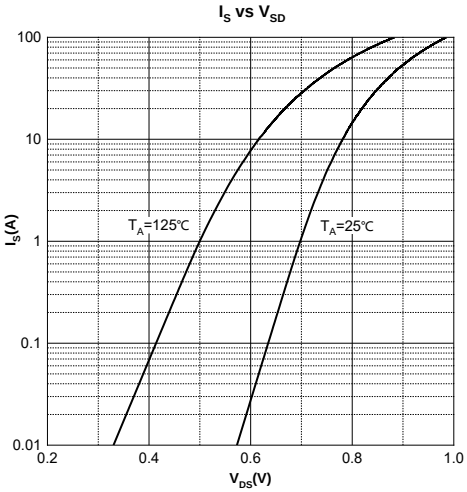
Typical Characteristics

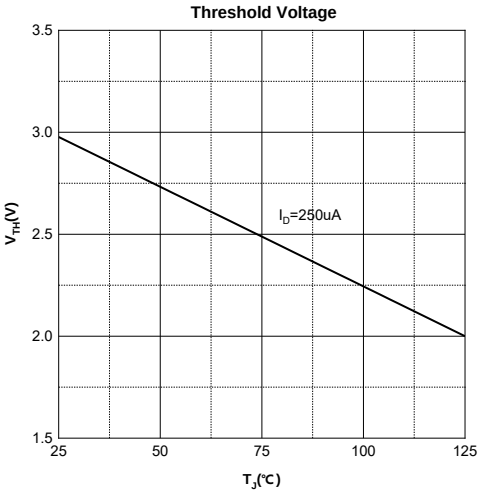


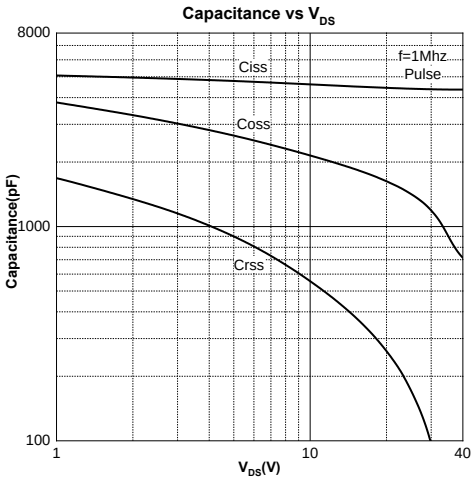


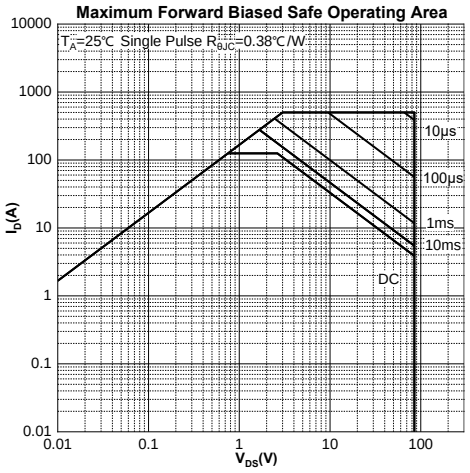


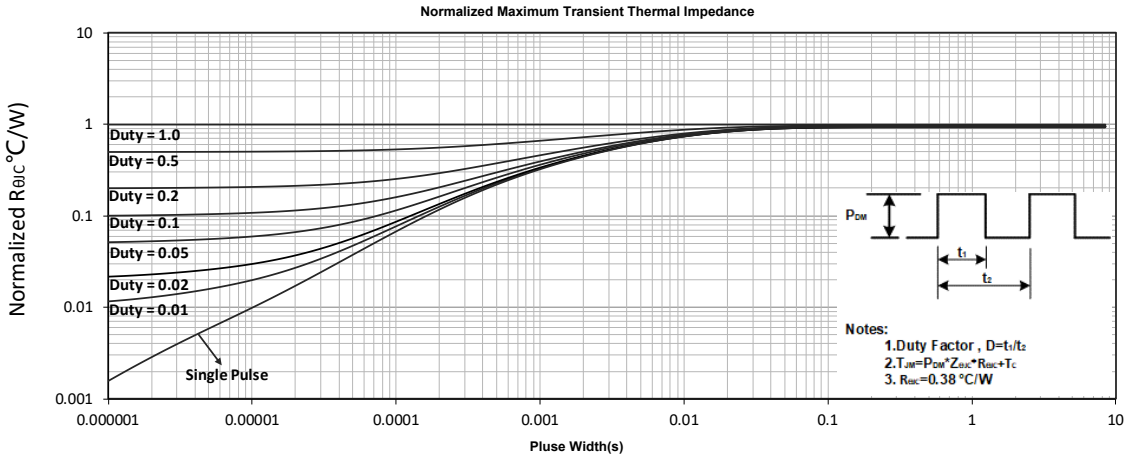




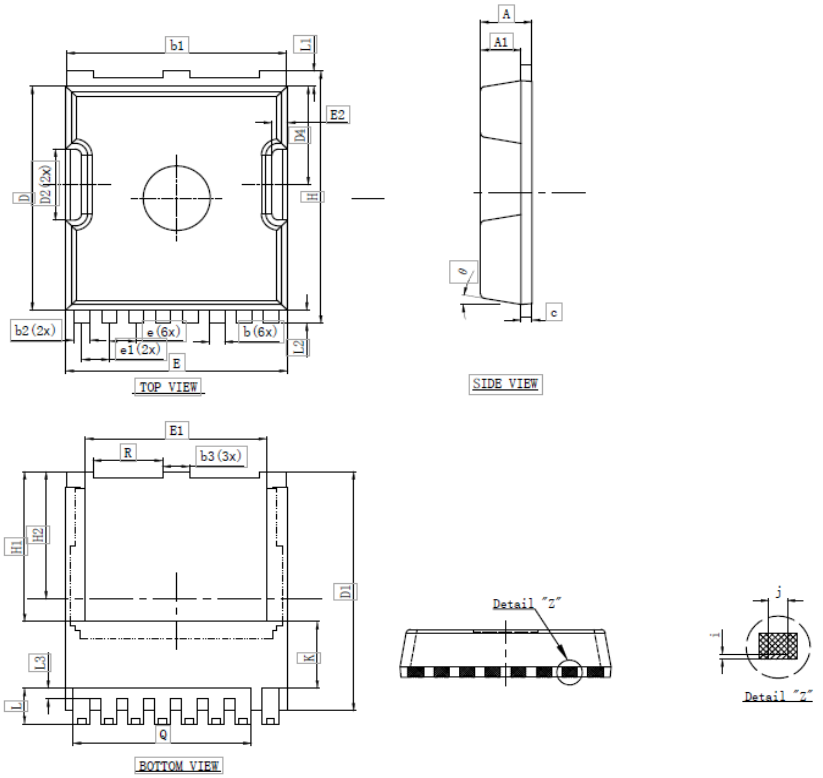



Capacitance vs V_{DS}
8000
1000
100
1
10
40
Ciss
Coss
Crss
f=1Mhz
Pulse
Capacitance(pF)
V_{DS}(V)


Maximum Forward Biased Safe Operating Area
T_A=25℃ Single Pulse $R_{\theta JC}$=0.38℃/W
10000
1000
100
10
1
0.1
0.01
0.01
0.1
1
10
100
10μs
100μs
1ms
10ms
DC
I_D(A)
V_{DS}(V)


Normalized Maximum Transient Thermal Impedance
Normalized $R_{\theta JC}$℃/W
10
1
0.1
0.01
0.001
Duty = 1.0
Duty = 0.5
Duty = 0.2
Duty = 0.1
Duty = 0.05
Duty = 0.02
Duty = 0.01
Single Pulse
P_{DM}
t_1
t_2
Notes:
1.Duty Factor , D=t_1/t_2
2.$T_{JM}=P_{DM}*Z_{\theta JC}*R_{\theta JC}+T_C$
3. $R_{\theta JC}$=0.38 °C/W
0.000001
0.00001
0.0001
0.001
0.01
0.1
1
10
Pluse Width(s)

TOLL Package Information



SYMBOL	MILLIMETER		Dimensions In Inches	
	MIN.	MAX.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	1.700	1.900	0.067	0.075
b	0.600	0.800	0.024	0.031
b1	9.700	9.900	0.382	0.390
b2	0.650	0.850	0.026	0.033
b3	1.100	1.300	0.043	0.051
c	0.400	0.600	0.016	0.024
D	10.300	10.500	0.406	0.413
D1	11.000	11.200	0.433	0.441
D2	3.200	3.400	0.126	0.134
D4	4.470	4.670	0.176	0.184
E	9.800	10.000	0.386	0.394
E1	8.000	8.200	0.315	0.323
E2	0.500	0.700	0.020	0.028
e	1.200 BSC		0.047BSC	
e1	1.225 BSC		0.048BSC	
H	11.600	11.800	0.457	0.465
H1	6.950 BSC		0.247BSC	
H2	5.900 BSC		0.232BSC	
i	0.100 REF		0.004REF	
j	0.350 REF		0.014REF	
K	3.100 REF		0.122REF	
L	1.550	1.750	0.061	0.069
L1	0.600	0.800	0.024	0.031
L2	0.500	0.700	0.020	0.028
L3	0.400	0.600	0.016	0.024
Q	7.950 REF		0.313REF	
R	3.000	3.200	0.118	0.126
θ	10°			