

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
40V	5.6m Ω @10V	44A
	7.3m Ω @4.5V	

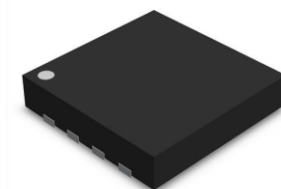
Feature

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

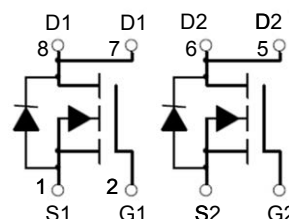
Application

- Power Management
- Load Switching

DFN3.3X3.3-8L



Schematic diagram



Package Marking and Ordering Information

Part Number	Package	Marking	Packing	Reel Size	Tape Width	Qty
GPT052ND04LGL	DFN3.3X3.3-8L	T052ND04L	Reel & Tape	330mm	12mm	5000pcs

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	40	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current ¹	$T_C = 25^\circ\text{C}$	I_D	44	A
	$T_C = 70^\circ\text{C}$		28	
Pulsed Drain Current ²		I_{DM}	176	A
Single Pulsed Avalanche Current ³		I_{AS}	18	A
Single Pulsed Avalanche Energy ³		E_{AS}	81	mJ
Power Dissipation ⁵		P_D	25	W
$T_C = 25^\circ\text{C}$				
Thermal Resistance from Junction to Ambient ⁶		$R_{\theta JA}$	50	$^\circ\text{C/W}$
Thermal Resistance from Junction to Case		$R_{\theta JC}$	5	$^\circ\text{C/W}$
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55~ +150	$^\circ\text{C}$

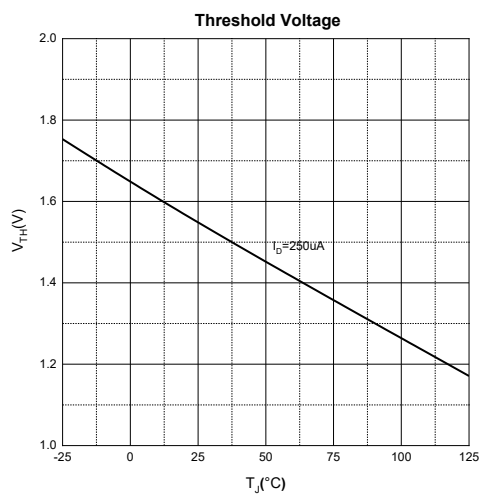
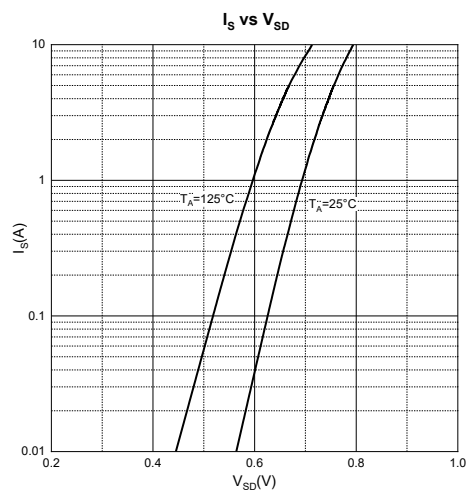
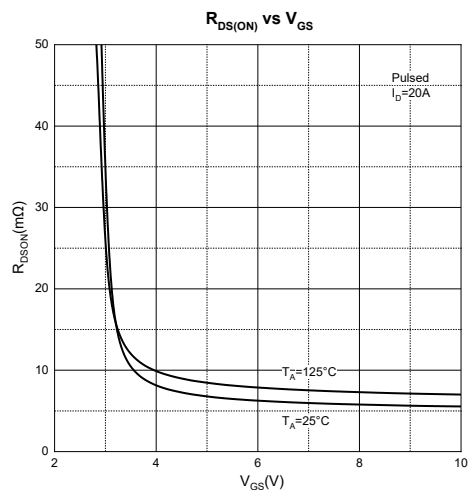
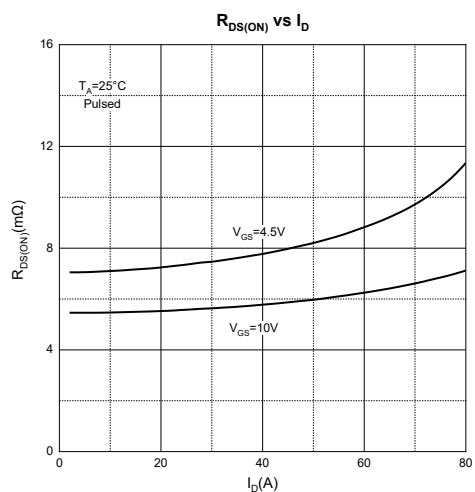
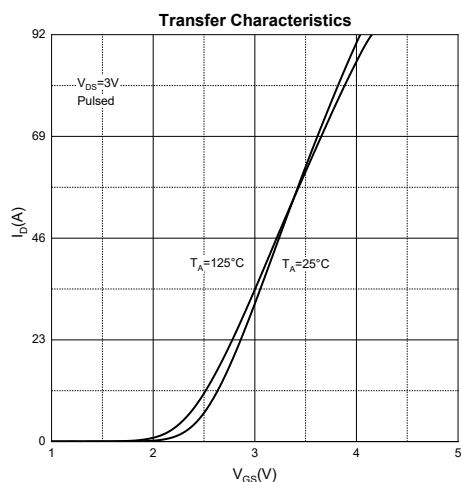
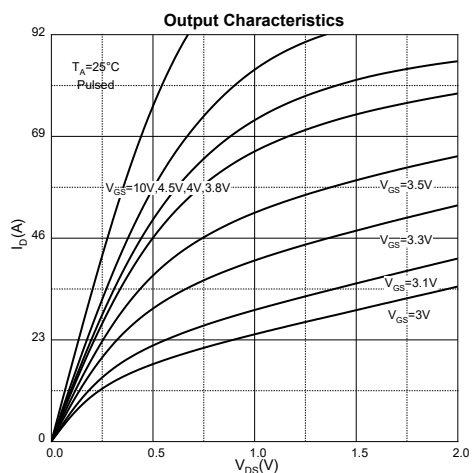
MOSFET ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

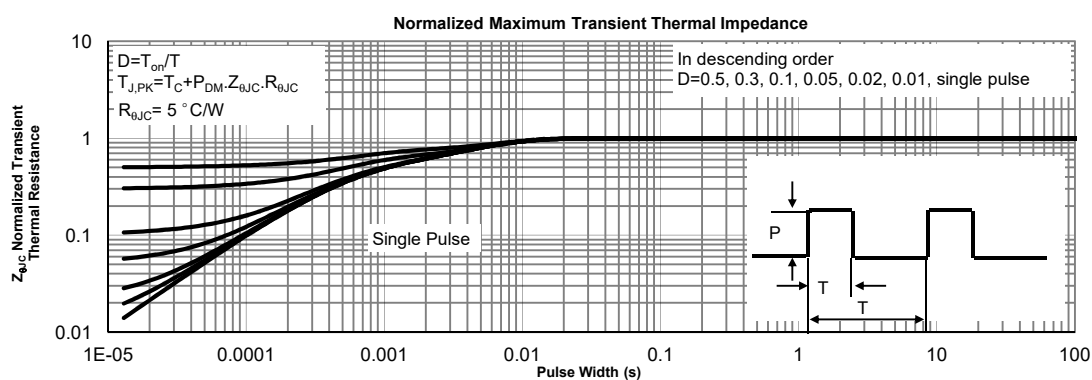
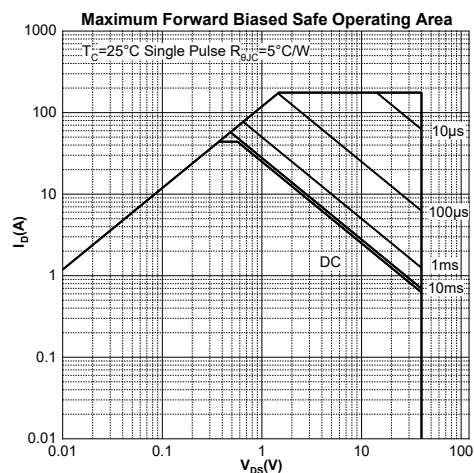
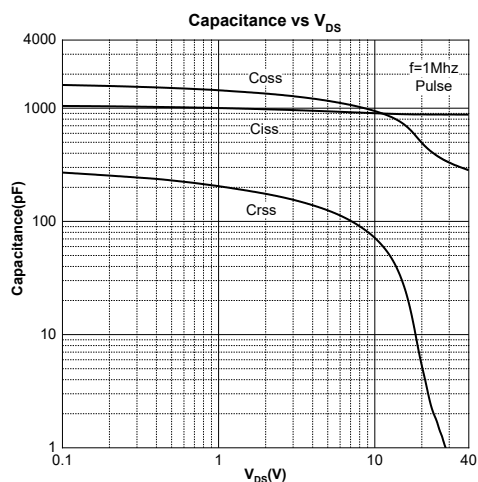
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	40			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 40V, V_{GS} = 0V$			1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 100	nA
On Characteristics ⁴						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1	1.5	2.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 20A$		5.6	7.8	m Ω
		$V_{GS} = 4.5V, I_D = 15A$		7.3	11	
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS} = 15V, V_{GS} = 0V, f = 1MHz$		881		pF
Output Capacitance	C_{oss}			499		
Reverse Transfer Capacitance	C_{rss}			5.5		
Gate Resistance	R_g	$V_{DS} = 0V, V_{GS} = 0V, f = 1MHz$		5		Ω
Switching Characteristics						
Total Gate Charge	Q_g	$V_{DS} = 15V, V_{GS} = 10V, I_D = 20A$		15.6		nC
Gate-Source Charge	Q_{gs}			2.5		
Gate-Drain Charge	Q_{gd}			2.9		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 20V, V_{GS} = 10V, R_G = 3\Omega, R_L = 1\Omega$		6.1		ns
Turn-On Rise Time	t_r			50		
Turn-Off Delay Time	$t_{d(off)}$			19		
Turn-Off Fall Time	t_f			6.1		
Source-Drain Diode Characteristics						
Diode Forward Voltage ⁴	V_{SD}	$V_{GS} = 0V, I_S = 1A$			1.2	V
Diode Reverse Recovery Time	t_{rr}	$I_F = 20A, dI/dt = 100A/\mu s$		29		ns
Diode Reverse Recovery Charge	Q_{rr}			16		nC

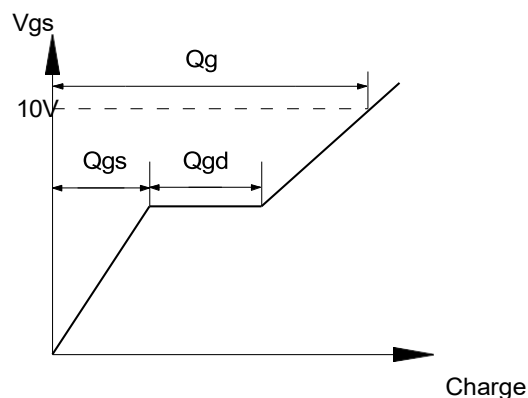
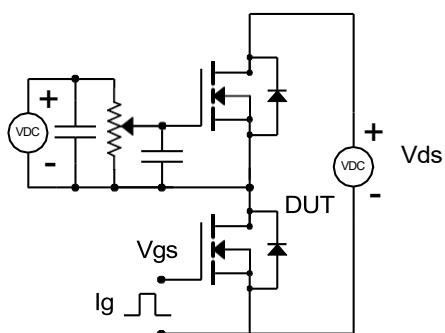
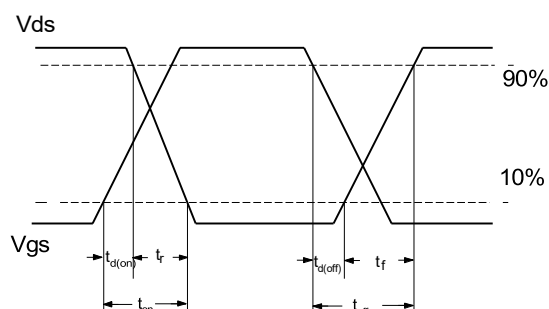
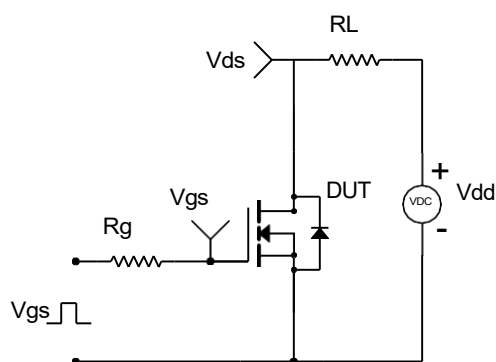
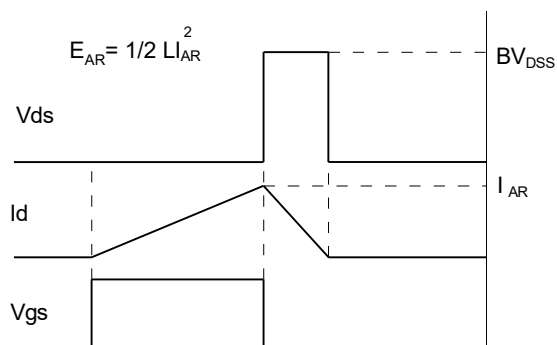
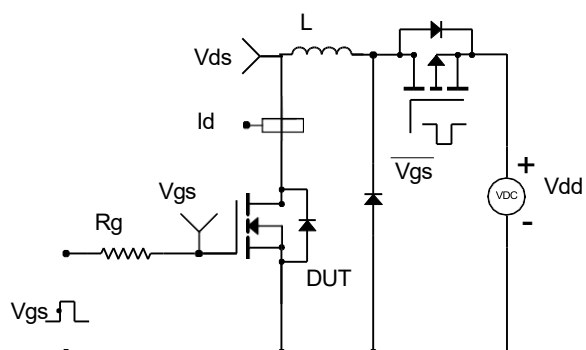
Notes:

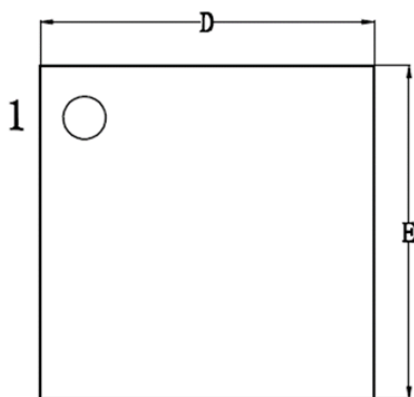
1. The maximum current rating is limited by package. And device mounted on a large heatsink.
2. Pulse Test: Pulse Width $\leq 10\mu s$, duty cycle $\leq 1\%$.
3. E_{AS} condition: $V_{DD} = 40V, V_{GS} = 10V, L = 0.5mH, R_G = 25\Omega$ Starting $T_J = 25^\circ\text{C}$.
4. Pulse Test: Pulse Width $\leq 400\mu s$, duty cycle $\leq 2\%$.
5. The power dissipation P_D is limited by $T_{J(MAX)} = 150^\circ\text{C}$. 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 $T_A = 25^\circ\text{C}$.

Typical Characteristics

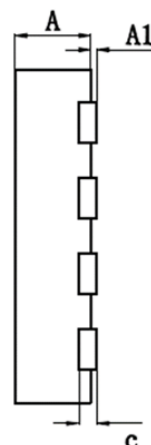




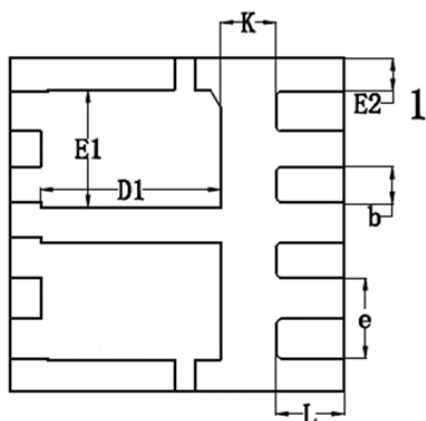
Test Circuit
Gate Charge Test Circuit & Waveform

Resistive Switching Test Circuit & Waveform

Unclamped Inductive Switching (UIS) Test Circuit & Waveforms


DFN3.3X3.3-8L Package Information


俯视图



侧视图



底视图

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.800	0.028	0.031
A1	0.000	0.050	0.000	0.002
c	0.203TYP		0.008TYP	
D	3.200	3.400	0.126	0.134
E	3.200	3.400	0.128	0.132
D1	1.680	2.000	0.066	0.079
E1	1.060	1.260	0.042	0.050
E2	0.325REF		0.013REF	
b	0.300	0.450	0.012	0.018
e	0.750BSC		0.030BSC	
K	0.55REF		0.022REF	
L	0.570	0.720	0.022	0.028

Attention:

- GreenPower Electronics reserves the right to improve product design function and reliability without notice.
- Any and all semiconductor products have certain probability to fail or malfunction, which may result in personal injury, death or property damage. Customer are solely responsible for providing adequate safe measures when design their systems.
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