

Product Summary

V _{(BR)DSS}	R _{DS(on)TYP}	I _D
30V	4.3mΩ@10V(Channel1)	54A
	6.5mΩ@4.5V(Channel1)	
	2.8mΩ@10V(Channel2)	60A
	4.5mΩ@4.5V(Channel2)	

Feature

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

Application

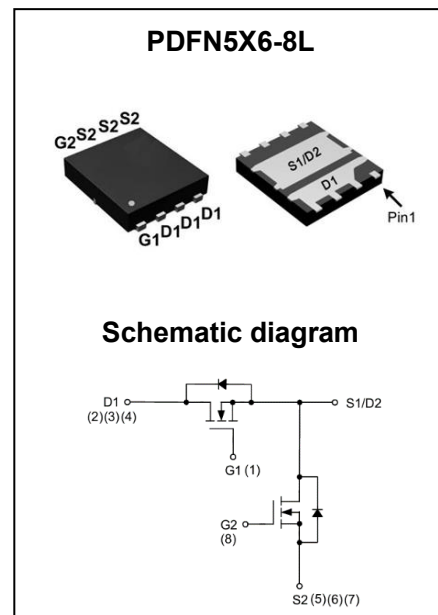
- Power Management
- DC/DC Converter

Package Marking and Ordering Information

Part Number	Package	Marking	Packing	Reel Size	Tape Width	Qty
GPT050ND03LNF	PDFN5X6-8L	T050ND03L	Reel & Tape	330mm	12mm	5000pcs

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

Parameter		Symbol	Channel1	Channel2	Unit
Drain-Source Voltage		V _{DS}	30		V
Gate-Source Voltage		V _{GS}	±20		V
Continuous Drain Current ¹	T _C = 25°C	I _D	54	60	A
	T _C = 100°C		34	38	
Pulsed Drain Current ²		I _{DM}	216	240	A
Single Pulsed Avalanche Current ³		I _{AS}	20	24	A
Single Pulsed Avalanche Energy ³		E _{AS}	100	144	mJ
Power Dissipation ⁵	T _C = 25°C	P _D	25	41.6	W
Thermal Resistance from Junction to Ambient ⁶		R _{θJA}	80	45	°C/W
Thermal Resistance from Junction to Case		R _{θJC}	5	3	°C/W
Junction Temperature		T _J	150		°C
Storage Temperature		T _{STG}	-55~ +150		°C



MOSFET ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)
Channel1:

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = 250μA	30			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 30V, 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	1.4	1.7	2.5	V
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} = 10V, I _D = 15A		4.3	5.6	mΩ
		V _{GS} = 4.5V, I _D = 10A		6.5	8.5	
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} = 15V, V _{GS} = 0V, f = 1MHz		938		pF
Output Capacitance	C _{oss}			607		
Reverse Transfer Capacitance	C _{rss}			52		
Gate Resistance	R _g	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz		2.4		Ω
Switching Characteristics						
Total Gate Charge	Q _g	V _{DS} = 20V, V _{GS} = 10V, I _D = 15A		17		nC
Gate-Source Charge	Q _{gs}			3.1		
Gate-Drain Charge	Q _{gd}			3.5		
Turn-On Delay Time	t _{d(on)}	V _{DD} = 15V, V _{GS} = 10V, I _D = 1A, R _G = 6Ω, R _L = 15Ω		8		ns
Turn-On Rise Time	t _r			6		
Turn-Off Delay Time	t _{d(off)}			22		
Turn-Off Fall Time	t _f			7		
Source-Drain Diode Characteristics						
Diode Forward Voltage ⁴	V _{SD}	V _{GS} = 0V, I _S = 2A			1.2	V

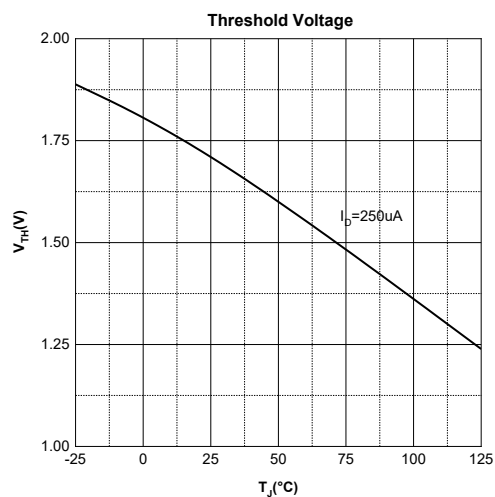
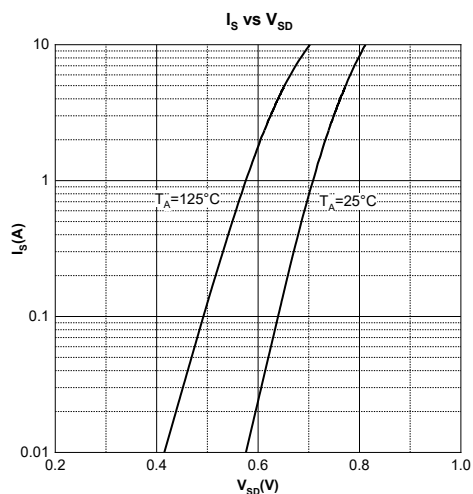
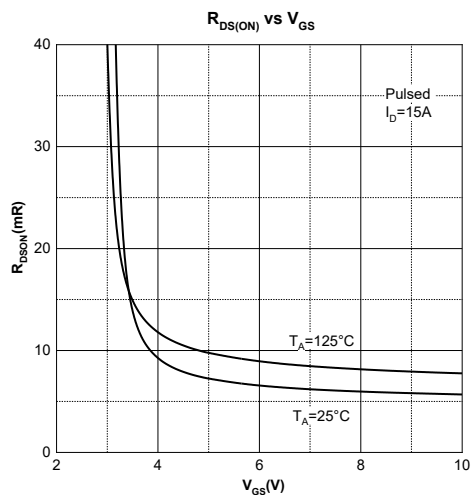
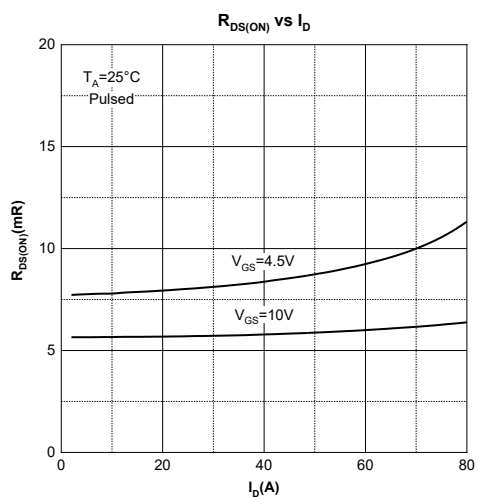
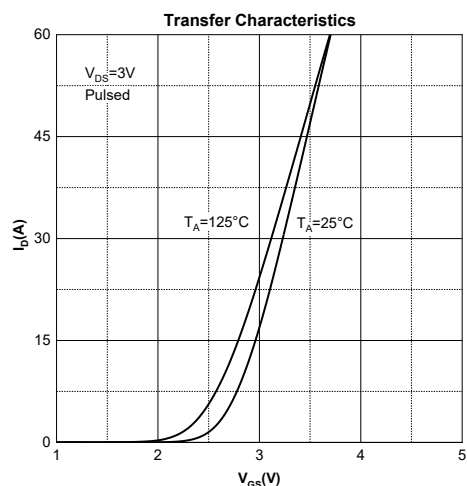
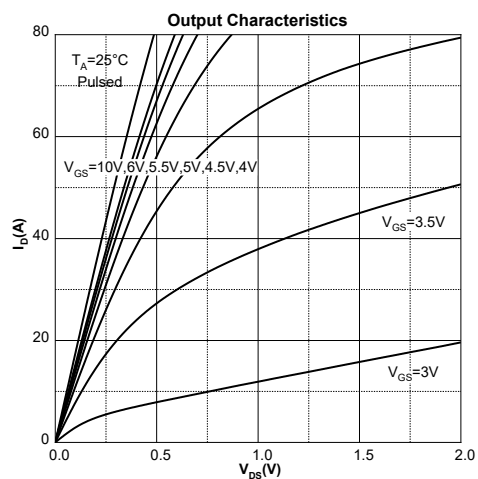
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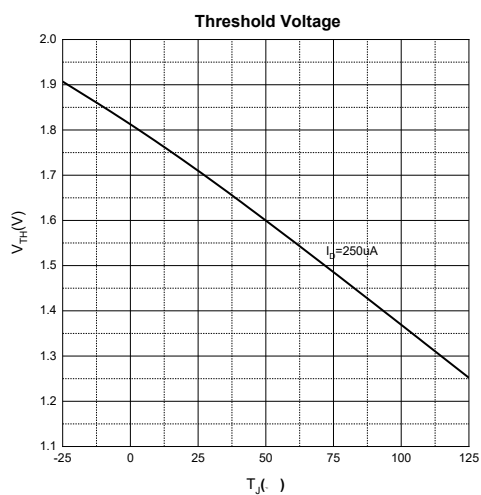
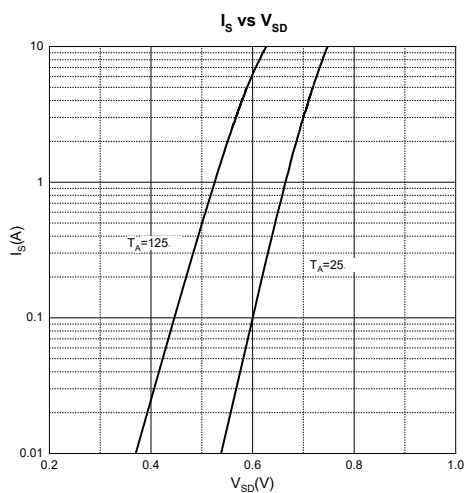
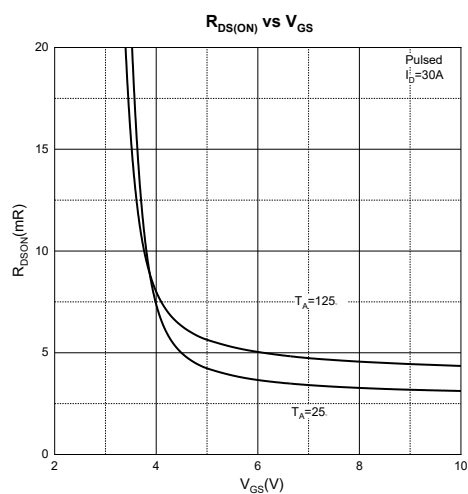
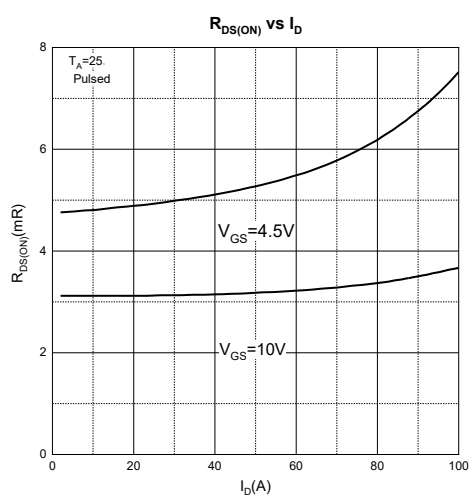
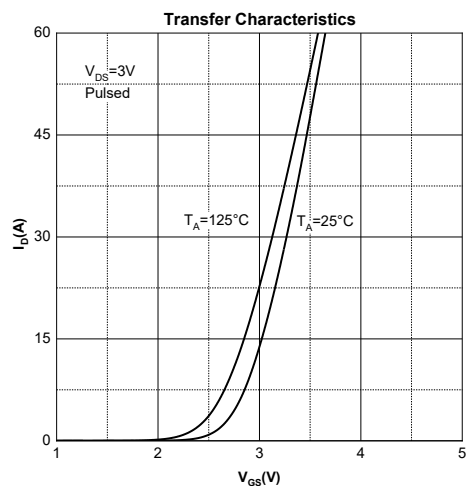
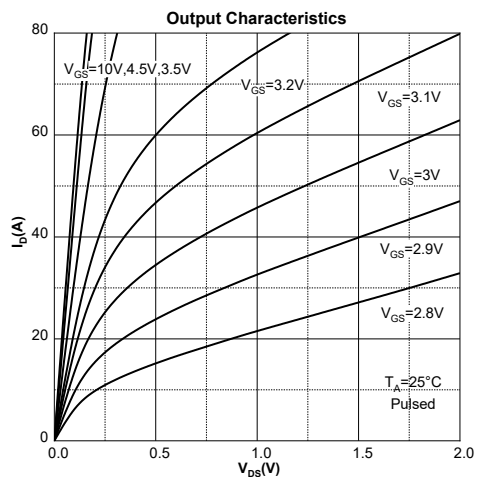
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	30			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 30V, V_{GS} = 0V$			1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 100	nA
On Characteristics ⁴						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.4	1.7	2.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 30A$		2.8	3.6	m Ω
		$V_{GS} = 4.5V, I_D = 15A$		4.5	5.9	
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS} = 15V, V_{GS} = 0V, f = 1MHz$		1391		pF
Output Capacitance	C_{oss}			465		
Reverse Transfer Capacitance	C_{rss}			16		
Gate Resistance	R_g	$V_{DS} = 0V, V_{GS} = 0V, f = 1MHz$		2.8		Ω
Switching Characteristics						
Total Gate Charge	Q_g	$V_{DS} = 20V, V_{GS} = 10V, I_D = 30A$		24		nC
Gate-Source Charge	Q_{gs}			4.6		
Gate-Drain Charge	Q_{gd}			4.8		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 15V, V_{GS} = 10V, I_D = 1A,$ $R_G = 6\Omega, R_L = 15\Omega$		14		ns
Turn-On Rise Time	t_r			10		
Turn-Off Delay Time	$t_{d(off)}$			30		
Turn-Off Fall Time	t_f			33		
Source-Drain Diode Characteristics						
Diode Forward Voltage ⁴	V_{SD}	$V_{GS} = 0V, I_S = 1A$			1.2	V

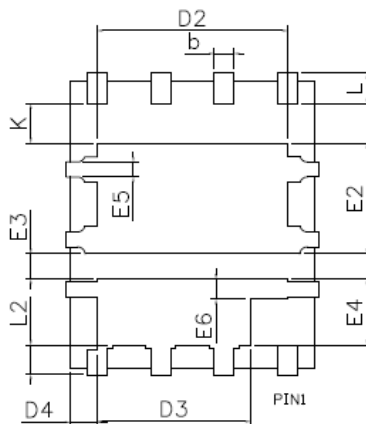
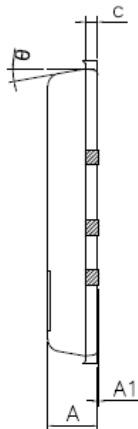
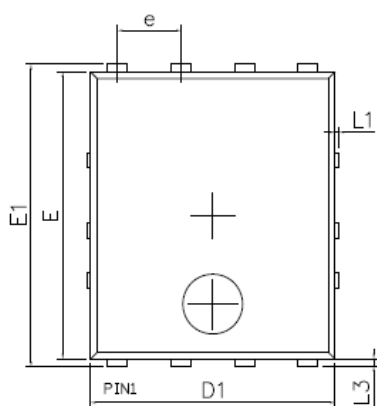
Notes:

- 1.The maximum current rating is limited by package. And device mounted on a large heatsink.
- 2.Pulse Test: Pulse Width $\leq 10\mu s$, duty cycle $\leq 1\%$.
- 3.EAS condition: $V_{DD} = 30V, V_{GS} = 10V, L = 0.5mH, R_G = 25\Omega$ Starting $T_J = 25^\circ C$.
- 4.Pulse Test: Pulse Width $\leq 300\mu s$, duty cycle $\leq 2\%$.
- 5.The power dissipation P_D is limited by $T_{J(MAX)} = 150^\circ C$. And device mounted on a large heatsink.
- 6.Device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ C$.

Typical Characteristics





PDFN5X6-8L Package Information


DIM	MILLIMETERS		
	MIN	NOM	MAX
A	0.90	1.00	1.10
A1	0.00	/	0.05
b	0.33	0.40	0.51
c	0.20	0.25	0.30
D1	4.80	4.90	5.00
D2	3.61	3.81	3.96
D3	2.87	3.07	3.22
D4	0.445	0.545	0.645
E	5.70	5.75	5.80
E1	5.90	6.05	6.15
E2	2.02	2.22	2.32
E3	0.40	0.50	0.60
E4	1.22	1.32	1.42
E5	0.20	/	0.40
E6	0.31	/	0.51
e	1.27 BSC		
L	0.51	0.58	0.71
L1	0.00	/	0.20
L2	0.48	0.58	0.68
L3	0.06	0.15	0.25
K	0.50	0.75	1.00
θ	0	10°	12°

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.
- GreenPower Electronics products belong to consumer electronics or other civilian electronic products.