



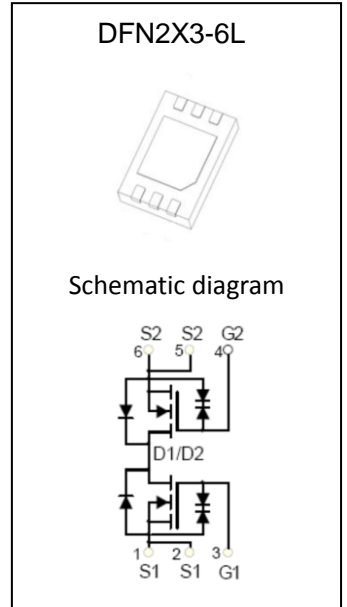
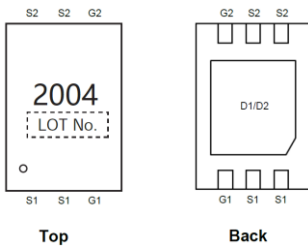
#### Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	$I_D$
20V	7.3mΩ@ 4.5V	10A
	7.6mΩ@ 4.0V	
	7.8mΩ@ 3.8V	
	8.2mΩ@ 3.1V	
	9.0mΩ@ 2.5V	

#### DESCRIPTION

The GPCD2004 uses advanced trench technology to provide excellent  $R_{DS(ON)}$  and low gate charge. It is ESD protected. This device is suitable for use as a uni-directional or bi-directional load switch, facilitated by its common-drain configuration.

#### MARKING:



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	20	V
Gate-Source Voltage	$V_{GS}$	$\pm 12$	V
Continuous Drain Current	$I_D$	10	A
Pulsed Drain Current	$I_{DM}$	50	A
Power Dissipation	$P_D$	1.5	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	83.3	$^\circ\text{C/W}$
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-55~ +150	
Lead Temperature for Soldering Purposes(1/8" from case for 10 s)	$T_L$	260	

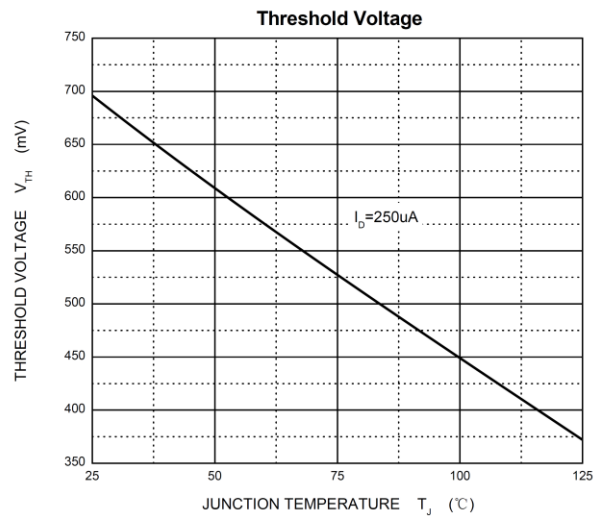
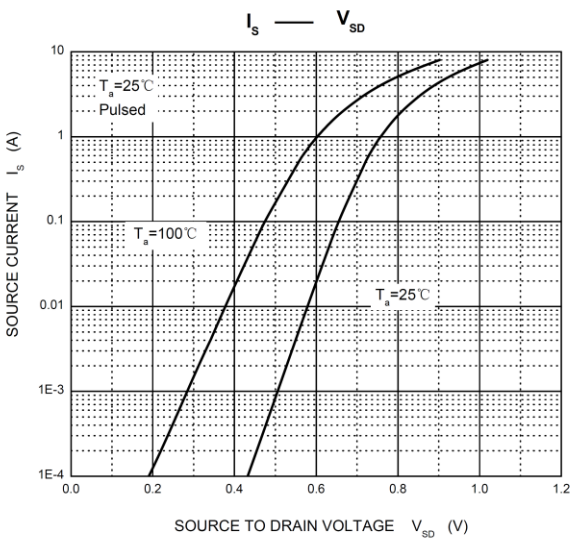
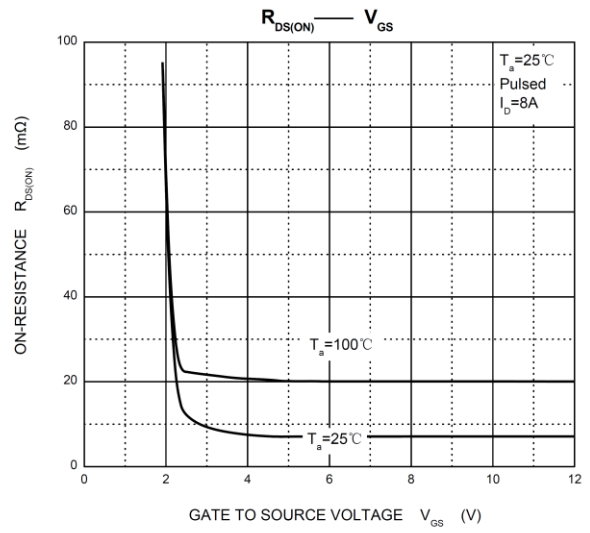
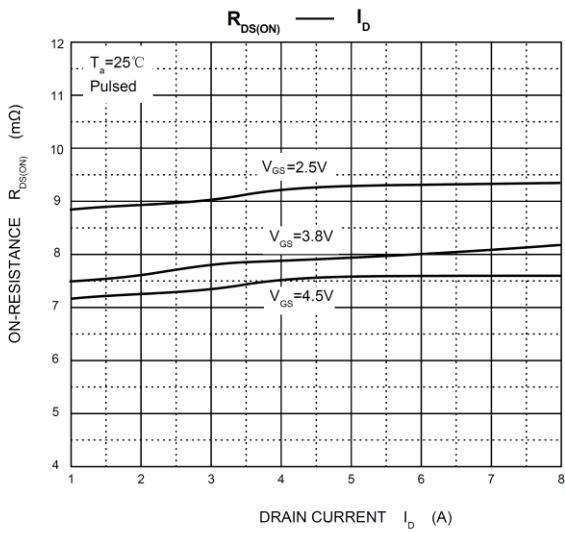
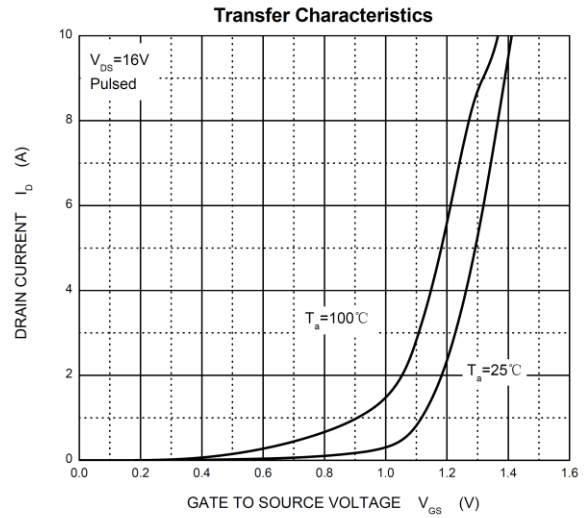
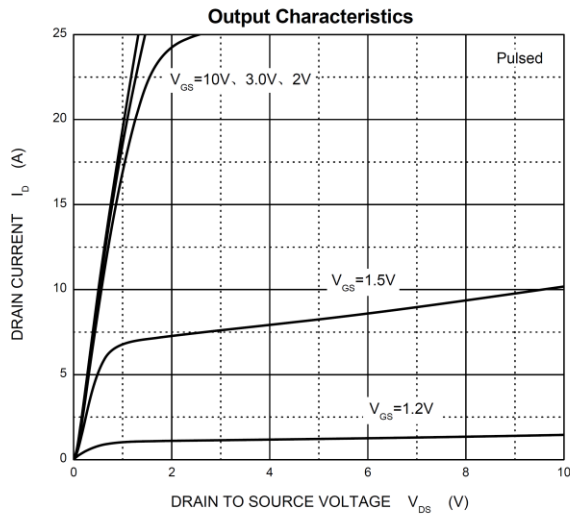
**MOSFET ELECTRICAL CHARACTERISTICS**( $T_A=25^{\circ}\text{C}$  unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>STATIC PARAMETERS</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	20			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 16V, V_{GS} = 0V$			1	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS} = \pm 4.5V, V_{DS} = 0V$			$\pm 1$	$\mu A$
		$V_{GS} = \pm 8V, V_{DS} = 0V$			$\pm 10$	$\mu A$
Gate Threshold Voltage <sup>1</sup>	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	0.4	0.7	1.0	V
Drain-Source on-Resistance <sup>1</sup>	$R_{DS(on)}$	$V_{GS} = 4.5V, I_D = 3A$	6.0	7.3	9.0	m $\Omega$
		$V_{GS} = 4.0V, I_D = 3A$	6.3	7.6	9.3	
		$V_{GS} = 3.8V, I_D = 3A$	6.5	7.8	9.7	
		$V_{GS} = 3.1V, I_D = 3A$	7.0	8.2	10.5	
		$V_{GS} = 2.5V, I_D = 3A$	7.5	9.0	12.5	
Forward Transconductance <sup>1</sup>	$g_{FS}$	$V_{DS} = 5V, I_D = 7A$	9	36		S
Diode Forward Voltage <sup>1</sup>	$V_{SD}$	$I_S = 1A, V_{GS} = 0V$			1	V
<b>DYNAMIC PARAMETERS<sup>2</sup></b>						
Input Capacitance	$C_{iss}$	$V_{DS} = 10V, V_{GS} = 0V, f = 1MHz$		1950		pF
Output Capacitance	$C_{oss}$			250		
Reverse Transfer Capacitance	$C_{rss}$			210		
Total Gate Charge	$Q_g$	$V_{DS} = 10V, V_{GS} = 4.5V, I_D = 7A$		17		nC
Gate-Source Charge	$Q_{gs}$			2.0		
Gate-Drain Charge	$Q_{gd}$			5.1		
<b>SWITCHING PARAMETERS<sup>2</sup></b>						
Turn-On Delay Time	$t_{d(on)}$	$V_{GS} = 5V, V_{DD} = 10V, R_L = 1.35\Omega, R_{GEN} = 3\Omega$		2.2		ns
Turn-On Rise Time	$t_r$			5.9		
Turn-Off Delay Time	$t_{d(off)}$			40		
Turn-Off Fall Time	$t_f$			90		
<b>Drain-Source Diode Characteristics</b>						
Diode Forward Current	$I_S$				6.0	A

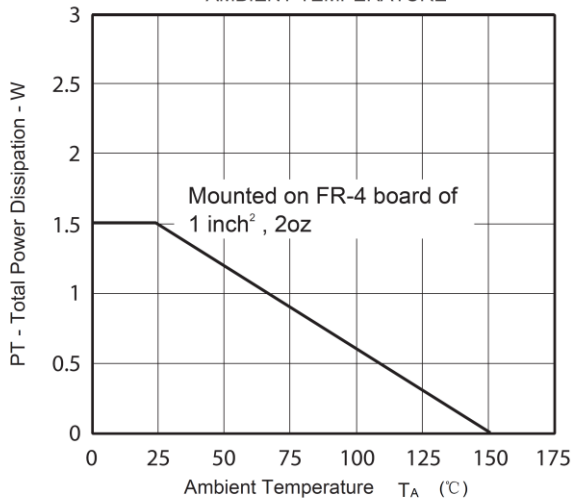
**Notes :**

1. Pulse Test : Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 0.5\%$ .
2. Guaranteed by design, not subject to production testing.

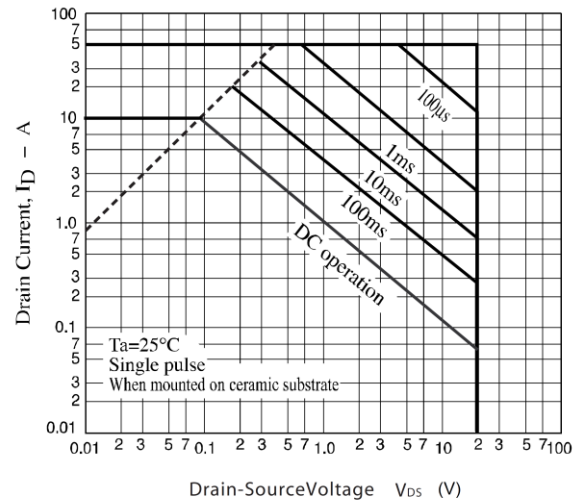
**Typical Electrical and Thermal Characteristics**



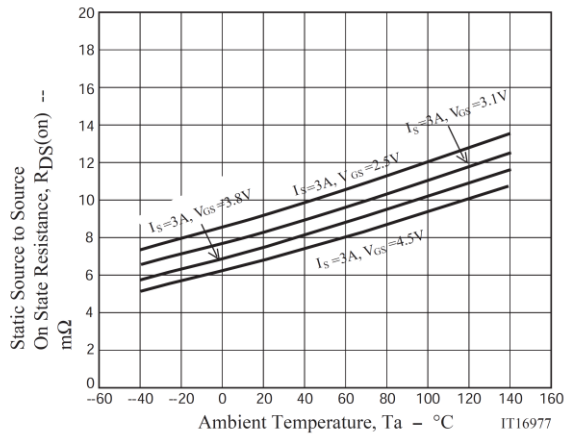
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE

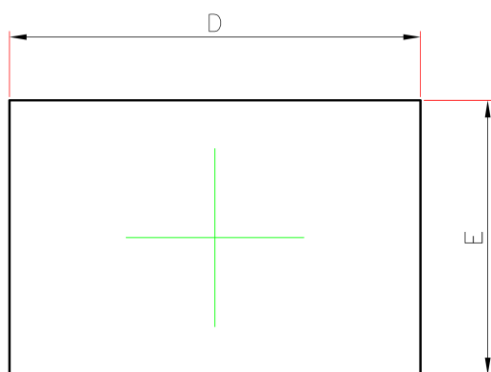
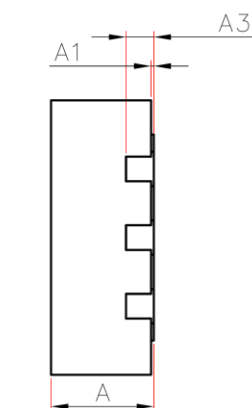
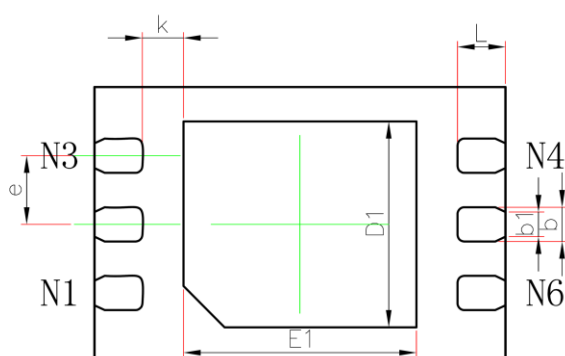


Maximum Safe Operating Area



$R_{DS(ON)}$  —  $T_A$



**DFN2X3-6L Package Information**

**TOP VIEW**

**SIDE VIEW**

**BOTTOM VIEW**

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
A3	0.203REF		0.008REF	
D	2.900	3.100	0.114	0.122
E	1.900	2.100	0.075	0.083
D1	1.400	1.600	0.055	0.063
E1	1.600	1.800	0.063	0.071
b	0.200	0.300	0.008	0.012
k	0.150	0.350	0.006	0.014
b1	0.180REF		0.007REF	
e	0.500BSC		0.020BSC	
L	0.300	0.450	0.012	0.018

**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.