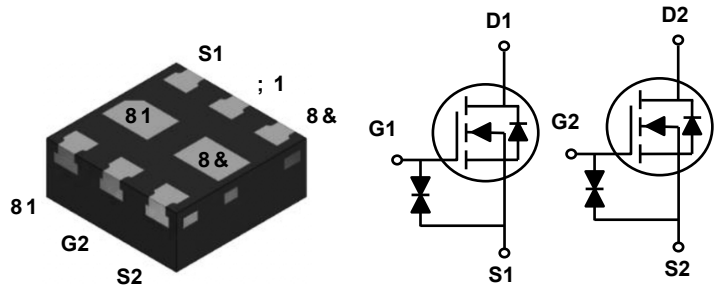


### Main Product Characteristics

$V_{(BR)DSS}$	20V
$R_{DS(ON)}$	400m $\Omega$ (Max.)
$I_D$	800mA



DFN1010B-3

Schematic Diagram

### Features and Benefits

- Advanced MOSFET process technology
- Ideal for high efficiency switched mode power supplies
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery



### Description

The GSFY2840K utilizes the latest techniques to achieve high cell density and low on-resistance. These features make this device extremely efficient and reliable for use in high efficiency switch mode power supplies and a wide variety of other applications.

### Absolute Maximum Ratings ( $T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain Source Voltage	$V_{DS}$	20	V
Gate Source Voltage	$V_{GS}$	$\pm 8$	V
Drain Current Continuous ( $T_C=25^\circ\text{C}$ )	$I_D$	800	mA
Drain Current Continuous ( $T_C=100^\circ\text{C}$ )		510	mA
Drain Current Pulsed <sup>1</sup>	$I_{DM}$	3.2	A
Power Dissipation ( $T_C=25^\circ\text{C}$ )	$P_D$	400	mW
Power Dissipation Derate above $25^\circ\text{C}$		3.2	mW/ $^\circ\text{C}$
Max. Thermal Resistance Junction to Ambient	$R_{\theta JA}$	350	$^\circ\text{C}/\text{W}$
Storage Temperature Range	$T_{STG}$	-55 to +150	$^\circ\text{C}$
Operating Junction Temperature Range	$T_J$	-55 to +150	$^\circ\text{C}$

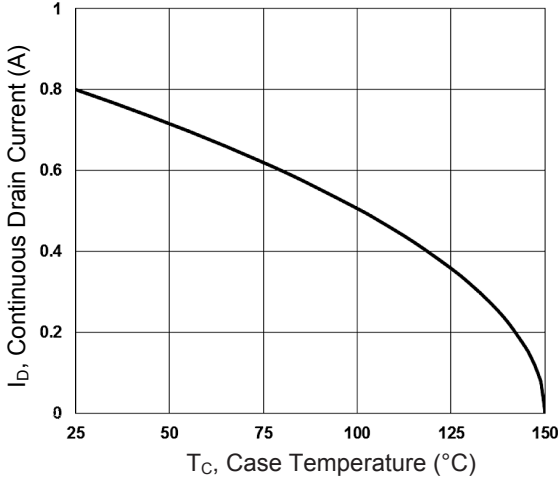
**Electrical Characteristics** ( $T_J=25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>On / Off Characteristics</b>						
Drain Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	20	-	-	V
$BV_{DSS}$ Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to $25^\circ\text{C}$ , $I_D=1mA$	-	-0.01	-	V/ $^\circ\text{C}$
Drain Source Leakage Current	$I_{DSS}$	$V_{DS}=20V, V_{GS}=0V, T_J=25^\circ\text{C}$	-	-	1	$\mu A$
		$V_{DS}=16V, V_{GS}=0V, T_J=125^\circ\text{C}$	-	-	10	$\mu A$
Gate Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 4.5V, V_{DS}=0V$	-	-	$\pm 1.5$	$\mu A$
Static Drain Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=4.5V, I_D=0.5A$	-	200	400	m $\Omega$
		$V_{GS}=2.5V, I_D=0.4A$	-	235	500	
		$V_{GS}=1.8V, I_D=0.2A$	-	560	700	
		$V_{GS}=1.5V, I_D=0.1A$	-	365	900	
		$V_{GS}=1.2V, I_D=0.1A$	-	600	1500	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.3	0.6	1.0	V
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}$		-	-1.6	-	mV/ $^\circ\text{C}$
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>2,3</sup>	$Q_g$	$V_{DS}=10V, I_D=0.5A, V_{GS}=4.5V$	-	1	-	nC
Gate Source Charge <sup>2,3</sup>	$Q_{gs}$		-	0.26	-	
Gate Drain Charge <sup>2,3</sup>	$Q_{gd}$		-	0.2	-	
Turn-On Delay Time <sup>2,3</sup>	$t_{d(on)}$	$V_{DD}=10V, R_G=10\Omega, V_{GS}=4.5V, I_D=0.5A$	-	5	-	nS
Rise Time <sup>2,3</sup>	$t_r$		-	3.5	-	
Turn-Off Delay Time <sup>2,3</sup>	$t_{d(off)}$		-	14	-	
Fall Time <sup>2,3</sup>	$t_f$		-	6	-	
Input Capacitance	$C_{iss}$	$V_{DS}=10V, V_{GS}=0V, F=1MHz$	-	38.2	-	pF
Output Capacitance	$C_{oss}$		-	14.4	-	
Reverse Transfer Capacitance	$C_{rss}$		-	6	-	
<b>Drain-Source Ratings and Characteristics</b>						
Continuous Source Current	$I_S$	$V_G=V_D=0V, \text{Force Current}$	-	-	0.8	A
Pulsed Source Current	$I_{SM}$		-	-	1.6	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=0.2A, T_J=25^\circ\text{C}$	-	-	1	V

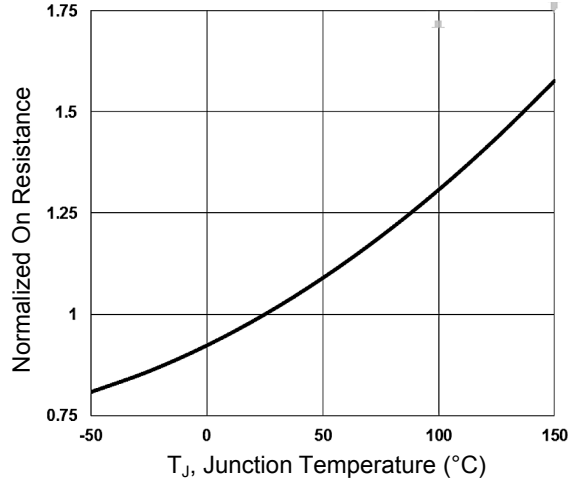
Notes:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed, pulse width  $\leq 300\mu S$ , duty cycle  $\leq 2\%$ .
3. Essentially independent of operating temperature.

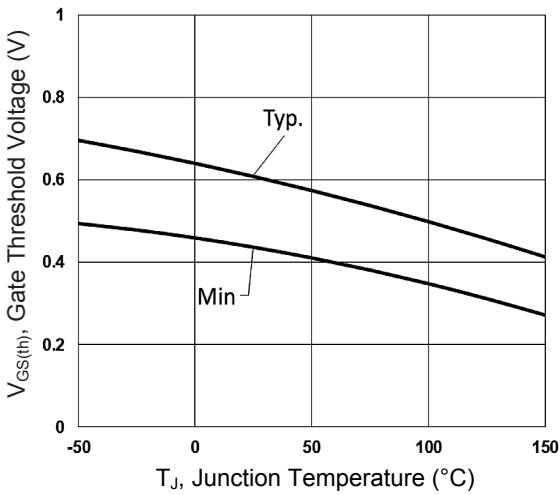
**Typical Electrical and Thermal Characteristic Curves**



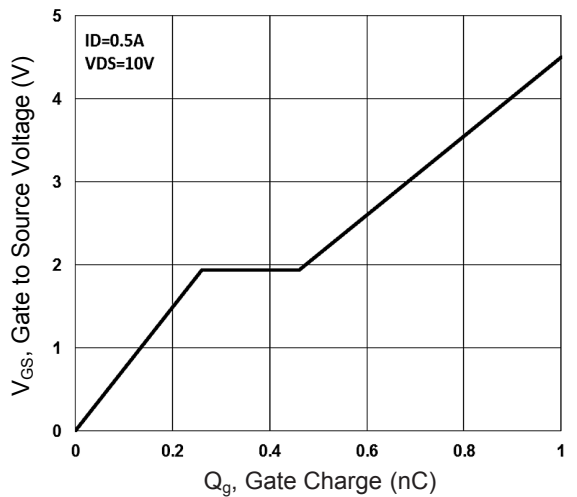
**Figure 1. Continuous Drain Current vs.  $T_c$**



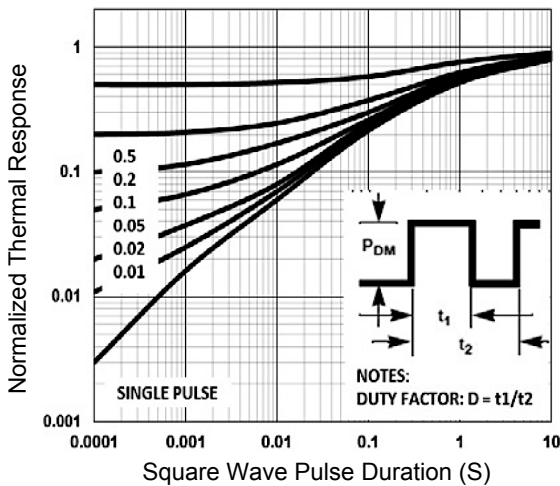
**Figure 2. Normalized  $R_{DS(ON)}$  vs.  $T_J$**



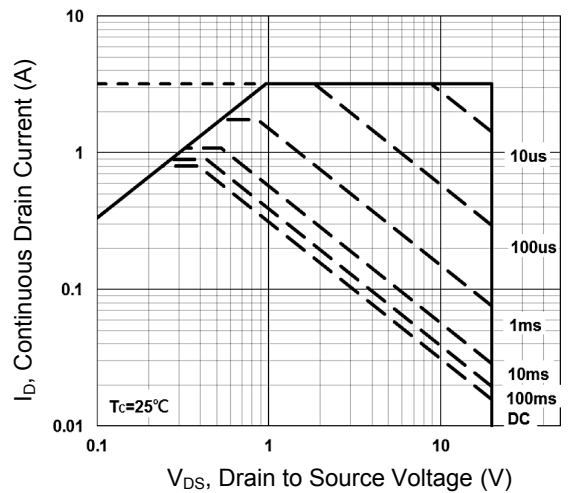
**Figure 3. Gate Threshold Voltage vs.  $T_J$**



**Figure 4. Gate Charge Waveform**

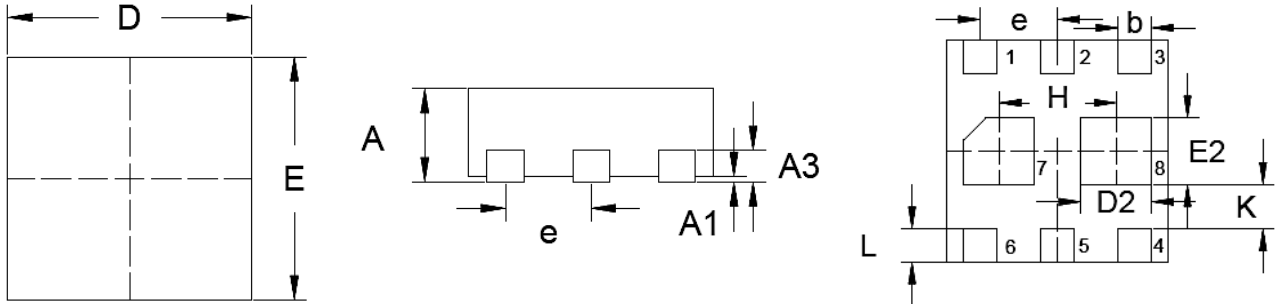


**Figure 5. Normalized Transient Impedance**



**Figure 6. Maximum Safe Operation Area**

**Package Outline Dimensions (DFN1010B-3)**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.31	0.40	0.012	0.016
A1	0.00	0.05	0.000	0.002
A3	0.127 Typ.		0.005 Typ.	
b	0.10	0.20	0.004	0.008
D	0.95	1.05	0.037	0.041
E	0.95	1.05	0.037	0.041
e	0.35 Typ.		0.014 Typ.	
D2	0.27	0.37	0.011	0.015
E2	0.25	0.35	0.010	0.014
H	0.53 Typ.		0.021 Typ.	
L	0.10	0.20	0.004	0.008
K	0.20	-	0.008	-

**Order Information**

Device	Package	Marking	Packaging	SPQ
GSFY2840K	DFN1010B-3	4Y	Tape & Reel	5,000 Pcs / Reel