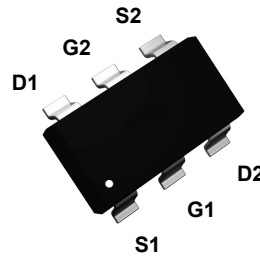
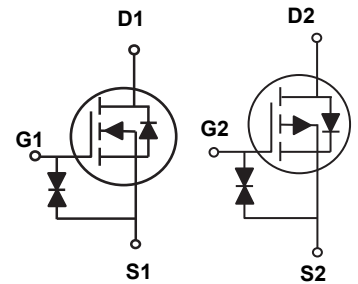


### Main Product Characteristics

$BV_{DSS}$	30V	-30V
$R_{DS(ON)}$	450m $\Omega$	1000m $\Omega$
$I_D$	800mA	-400mA



SOT-363



Schematic Diagram

### Features and Benefits

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



### Description

The GSKF3420 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 ( $T_C=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Rating		Unit
Drain-Source Voltage	$V_{DS}$	30	-30	V
Gate-Source Voltage	$V_{GS}$	$\pm 12$		V
Drain Current-Continuous ( $T_C=25^\circ\text{C}$ )	$I_D$	800	-400	mA
Drain Current-Continuous ( $T_C=100^\circ\text{C}$ )		510	-250	mA
Drain Current-Pulsed <sup>1</sup>	$I_{DM}$	3.2	-1.6	A
Power Dissipation ( $T_C=25^\circ\text{C}$ )	$P_D$	275		mW
Power Dissipation-Derate Above $25^\circ\text{C}$		2.2		mW/ $^\circ\text{C}$
Max. Thermal Resistance Junction to Ambient	$R_{\theta JA}$	450		$^\circ\text{C}/\text{W}$
Storage Temperature Range	$T_{STG}$	-55 To +150		$^\circ\text{C}$
Operating Junction Temperature Range	$T_J$	-55 To +150		$^\circ\text{C}$

### N-Channel Electrical Characteristics ( $T_J=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	30	-	-	V
$BV_{DSS}$ Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to $25^\circ\text{C}, I_D=1\text{mA}$	-	-0.03	-	$V/^\circ\text{C}$
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=30V, V_{GS}=0V, T_J=25^\circ\text{C}$	-	-	1	$\mu A$
		$V_{DS}=24V, V_{GS}=0V, T_J=125^\circ\text{C}$	-	-	10	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 12V, V_{DS}=0V$	-	-	$\pm 20$	$\mu A$
<b>On Characteristics</b>						
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=4.5V, I_D=0.3A$	-	370	450	m $\Omega$
		$V_{GS}=2.5V, I_D=0.2A$	-	510	650	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.5	0.7	1.2	V
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}$		-	-1.74	-	$\text{mV}/^\circ\text{C}$
Forward Transconductance	$g_{FS}$	$V_{DS}=4V, I_D=0.3A$	-	0.8	-	S
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>2,3</sup>	$Q_g$	$V_{DS}=15V, I_D=0.3A, V_{GS}=4.5V$	-	2.6	5.2	nC
Gate-Source Charge <sup>2,3</sup>	$Q_{gs}$		-	0.9	1.8	
Gate-Drain Charge <sup>2,3</sup>	$Q_{gd}$		-	0.6	1.2	
Turn-On Delay Time <sup>2,3</sup>	$t_{d(on)}$	$V_{DD}=15V, I_D=0.3A, V_{GS}=4.5V, R_G=10\Omega$	-	5.5	11	nS
Rise Time <sup>2,3</sup>	$t_r$		-	4	8	
Turn-Off Delay Time <sup>2,3</sup>	$t_{d(off)}$		-	14.5	29	
Fall Time <sup>2,3</sup>	$t_f$		-	6.5	13	
Input Capacitance	$C_{iss}$	$V_{DS}=15V, V_{GS}=0V, F=1\text{MHz}$	-	72.9	146	PF
Output Capacitance	$C_{oss}$		-	18.3	36.6	
Reverse Transfer Capacitance	$C_{rss}$		-	7.4	14.8	
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Continuous Source Current	$I_S$	$V_G=V_D=0V, \text{Force Current}$	-	-	0.78	A
Pulsed Source Current	$I_{SM}$		-	-	1.56	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=0.3A, T_J=25^\circ\text{C}$	-	-	1	V

Note :

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.

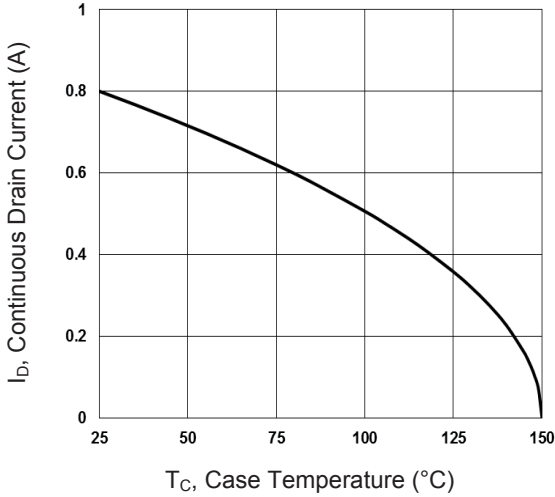
### P-Channel Electrical Characteristics ( $T_J=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-30	-	-	V
$BV_{DSS}$ Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to $25^\circ\text{C}$ , $I_D=-1\text{mA}$	-	-0.015	-	$V/^\circ\text{C}$
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=-30V, V_{GS}=0V, T_J=25^\circ\text{C}$	-	-	-1	$\mu A$
		$V_{DS}=-24V, V_{GS}=0V, T_J=125^\circ\text{C}$	-	-	-10	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 12V, V_{DS}=0V$	-	-	$\pm 40$	$\mu A$
<b>On Characteristics</b>						
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=-4.5V, I_D=-0.3A$	-	780	1000	m $\Omega$
		$V_{GS}=-2.5V, I_D=-0.2A$	-	1160	1600	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.5	-0.7	-1.2	V
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}$		-	-1.78	-	mV/ $^\circ\text{C}$
Forward Transconductance	$g_{FS}$	$V_{DS}=-4V, I_D=-0.3A$	-	0.8	-	S
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>2,3</sup>	$Q_g$	$V_{DS}=-15V, I_D=-0.3A, V_{GS}=-4.5V$	-	3.12	6.2	nC
Gate-Source Charge <sup>2,3</sup>	$Q_{gs}$		-	1.3	2.6	
Gate-Drain Charge <sup>2,3</sup>	$Q_{gd}$		-	0.5	1	
Turn-On Delay Time <sup>2,3</sup>	$t_{d(on)}$	$V_{DD}=-15V, I_D=-1A, V_{GS}=-10V, R_G=6\Omega$	-	7.4	15	nS
Rise Time <sup>2,3</sup>	$t_r$		-	21.5	43	
Turn-Off Delay Time <sup>2,3</sup>	$t_{d(off)}$		-	46.9	92	
Fall Time <sup>2,3</sup>	$t_f$		-	14.4	29	
Input Capacitance	$C_{iss}$	$V_{DS}=-15V, V_{GS}=0V, F=1.0\text{MHz}$	-	73.4	146	pF
Output Capacitance	$C_{oss}$		-	19.1	38	
Reverse Transfer Capacitance	$C_{rss}$		-	12.1	25	
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Continuous Source Current	$I_S$	$V_G=V_D=0V,$ Force Current	-	-	-0.55	A
Pulsed Source Current	$I_{SM}$		-	-	-1.1	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=-0.3A, T_J=25^\circ\text{C}$	-	-	-1	V

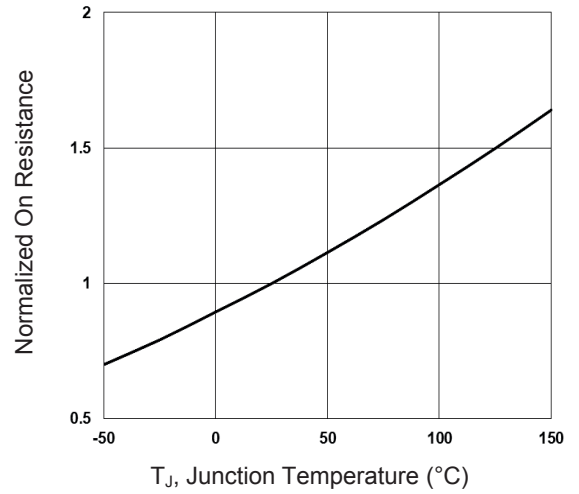
Note :

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.

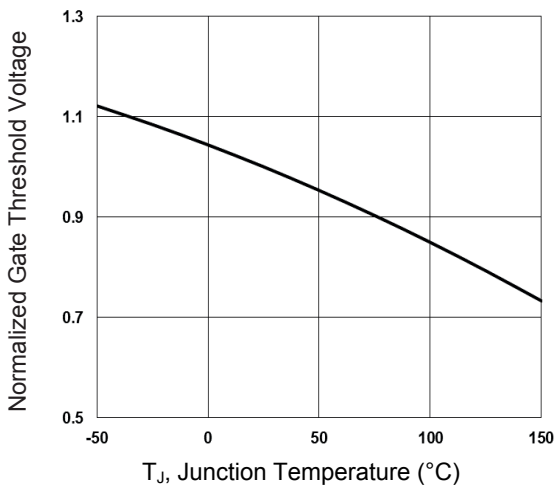
**N-Channel Typical Electrical and Thermal Characteristic Curves**



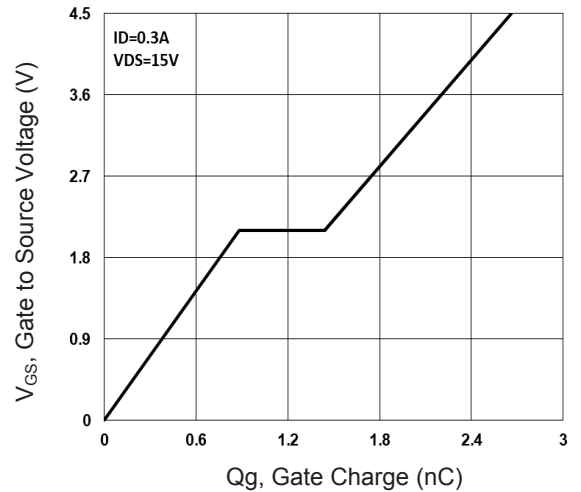
**Figure 1. Continuous Drain Current vs.  $T_c$**



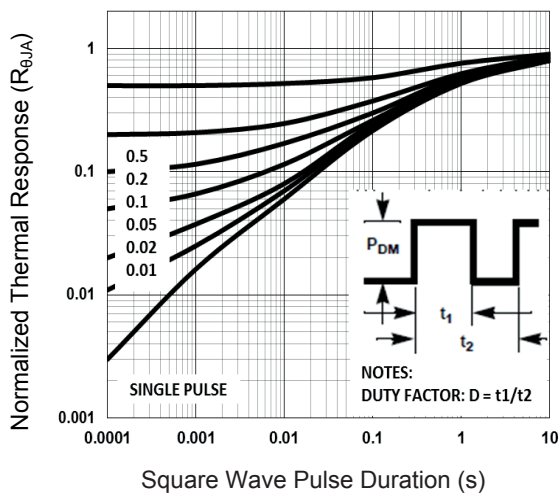
**Figure 2. Normalized  $R_{DSON}$  vs.  $T_j$**



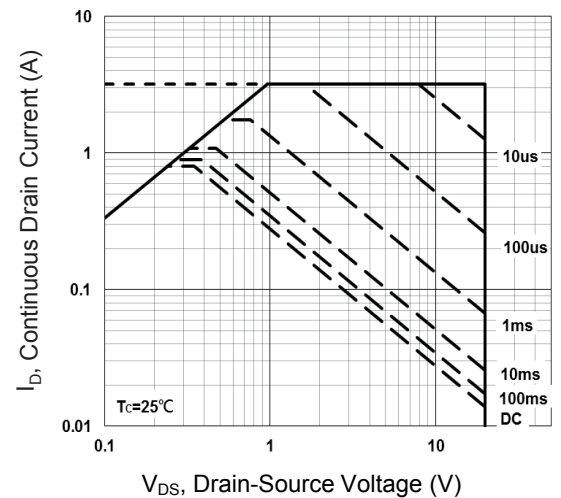
**Figure 3. Normalized  $V_{th}$  vs.  $T_j$**



**Figure 4. Gate Charge Waveform**

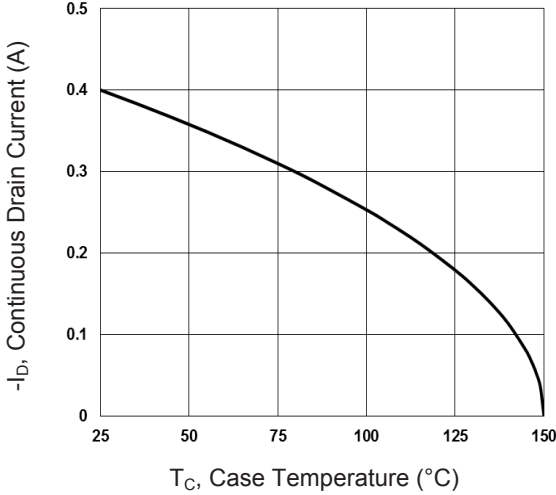


**Figure 5. Normalized Transient Impedance**

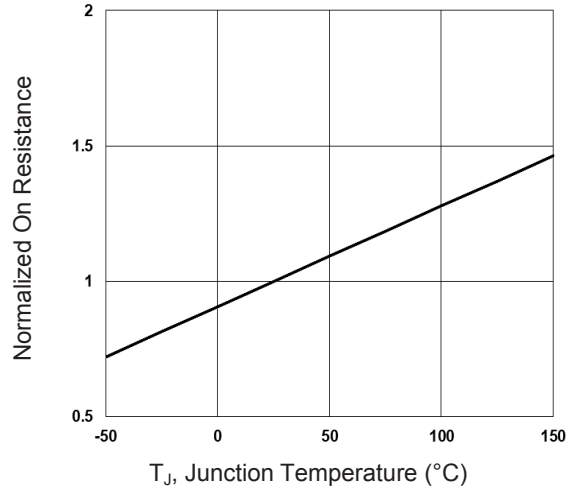


**Figure 6. Maximum Safe Operation Area**

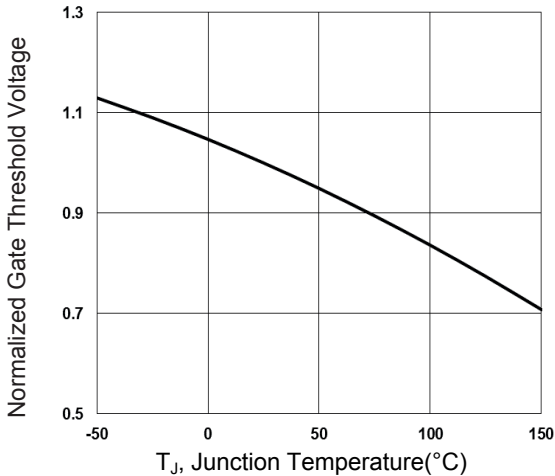
### P-Channel Typical Electrical and Thermal Characteristic Curves



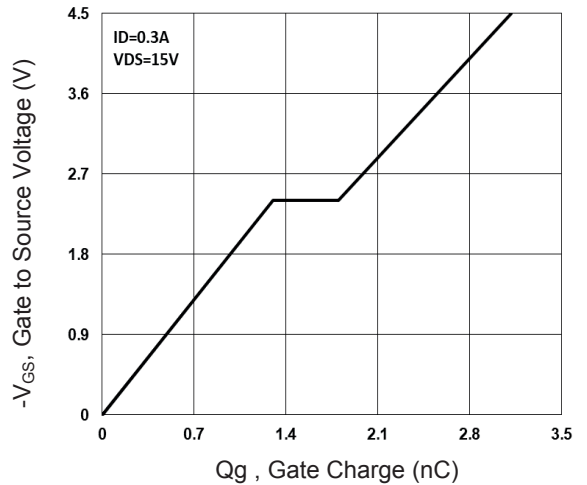
**Figure 7. Continuous Drain Current vs.  $T_C$**



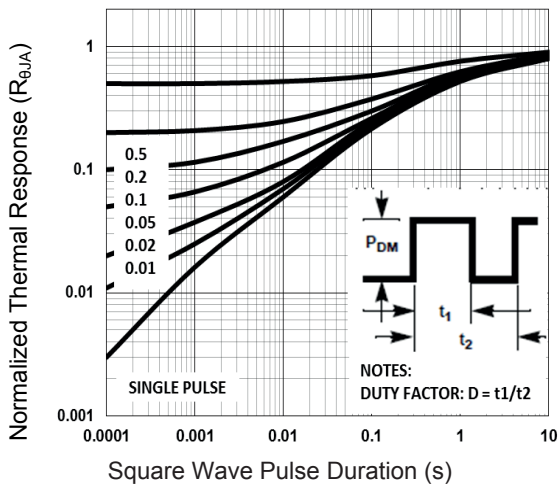
**Figure 8. Normalized  $R_{DS(on)}$  vs.  $T_J$**



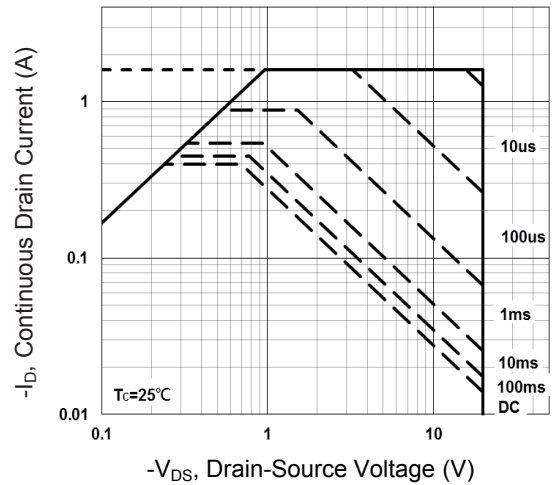
**Figure 9. Normalized  $V_{th}$  vs  $T_J$**



**Figure 10. Gate Charge Waveform**

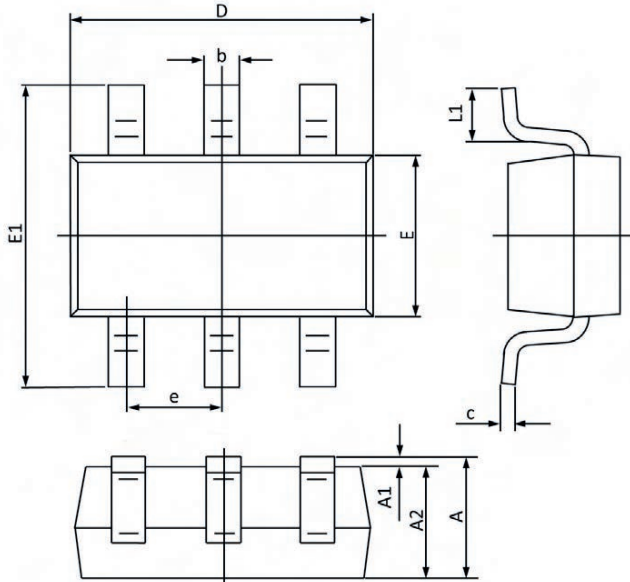


**Figure 11. Normalized Transient Impedance**



**Figure 12. Maximum Safe Operation Area**

## Package Outline Dimensions (SOT-363)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.800	1.100	0.031	0.043
A1	0.000	0.100	0.000	0.004
A2	0.800	1.000	0.031	0.039
b	0.100	0.350	0.004	0.014
c	0.080	0.250	0.003	0.010
D	1.800	2.200	0.071	0.087
E	1.150	1.350	0.045	0.053
E1	1.800	2.450	0.071	0.096
e	0.650 BSC		0.026 BSC	
L1	0.100	0.460	0.004	0.018

## Order Information

Device	Package	Marking	Carrier	Quantity
GSFK3420	SOT-363	W* (*Varied by lots)	Tape & Reel	3,000pcs / Reel

For more information, please contact us at: [inquiry@goodarksemi.com](mailto:inquiry@goodarksemi.com)