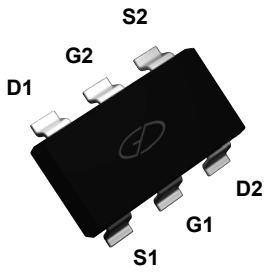
GOOD-ARK SEMICONDUCTOR

GSFK3420

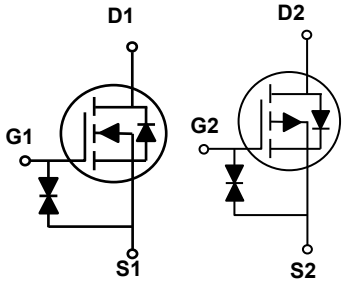
30V N-Channel + P-Channel Complementary MOSFETs

Main Product Characteristics

BV_{DS}	30V	-30V
$R_{DS(ON)}$	450mΩ	1000mΩ
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

RoHS Compliant

Description

The GSFK3420 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 supply and a wide variety of other applications.

Absolute Maximum Ratings (T_C=25°C unless otherwise specified)

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

N-Channel Electrical Characteristics (T_J=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	30	-	-	V
BV_{DSS} Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to 25°C, I_D=1mA	-	-0.03	-	V/°C
Drain-Source Leakage Current	I_{DSS}	V_{DS}=30V, V_{GS}=0V,T_J=25°C	-	-	1	μA
		V_{DS}=24V, V_{GS}=0V,T_J=125°C	-	-	10	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±12V, V_{DS}=0V	-	-	±20	μA
On Characteristics						
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=0.3A	-	370	450	mΩ
		V_{GS}=2.5V, I_D=0.2A	-	510	650	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	0.5	0.7	1.2	V
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}$		-	-1.74	-	mV/°C
Forward Transconductance	g_{FS}	V_{DS}=4V, I_D=0.3A	-	0.8	-	S
Dynamic and Switching Characteristics						
Total Gate Charge[2,3]	Q_g	V_{DS}=15V, I_D=0.3A, V_{GS}=4.5V	-	2.6	5.2	nC
Gate-Source Charge[2,3]	Q_{gs}		-	0.9	1.8	
Gate-Drain Charge[2,3]	Q_{gd}		-	0.6	1.2	
Turn-On Delay Time[2,3]	$t_{d(on)}$	V_{DD}=15V, I_D=0.3A V_{GS}=4.5V, R_G=10Ω	-	5.5	11	nS
Rise Time[2,3]	t_r		-	4	8	
Turn-Off Delay Time[2,3]	$t_{d(off)}$		-	14.5	29	
Fall Time[2,3]	t_f		-	6.5	13	
Input Capacitance	C_{lss}	V_{DS}=15V, V_{GS}=0V, F=1.0MHz	-	72.9	146	PF
Output Capacitance	C_{oss}		-	18.3	36.6	
Reverse Transfer Capacitance	C_{rss}		-	7.4	14.8	
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_S	V_G=V_D=0V, 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°C	-	-	1	V

Note :
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
3. Essentially independent of operating temperature.

P-Channel Electrical Characteristics (T_J=25°C unless otherwise specified)

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

Note :
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
3. Essentially independent of operating temperature.

N-Channel Typical Electrical and Thermal Characteristic Curves

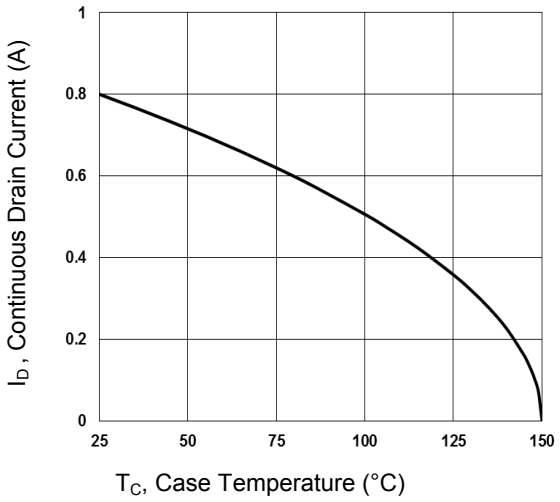


Figure 1. Continuous Drain Current vs.T_C

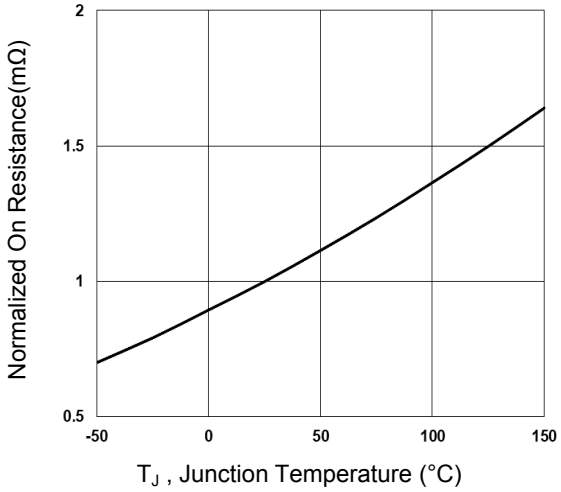


Figure 2. Normalized R_{DSON} vs. T_J

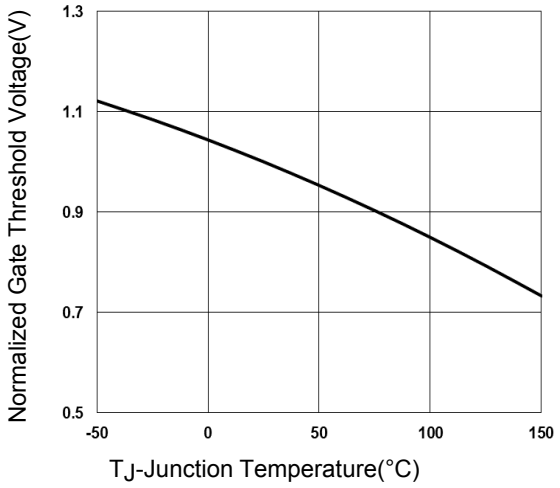


Figure 3. Normalized V_{th} VS T_J

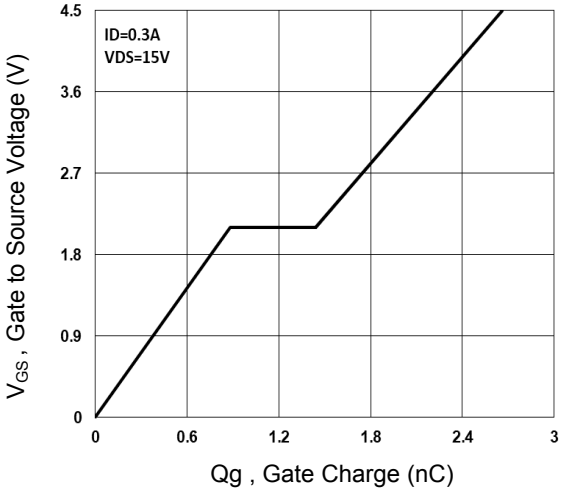


Figure 4. Gate Charge Waveform

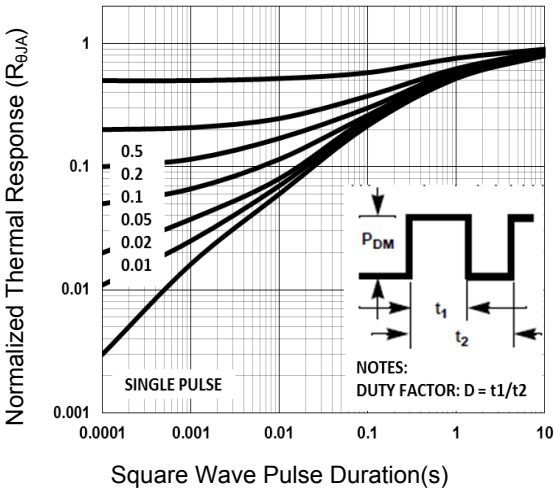


Figure 5. Normalized Transient Impedance

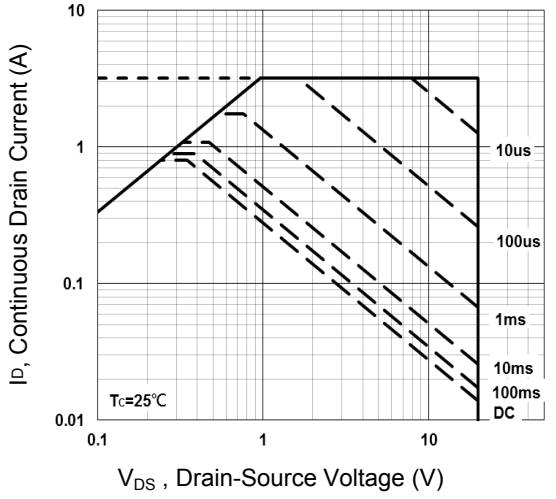


Figure 6. Maximum Safe Operation Area

P-Channel Typical Electrical and Thermal Characteristic Curves

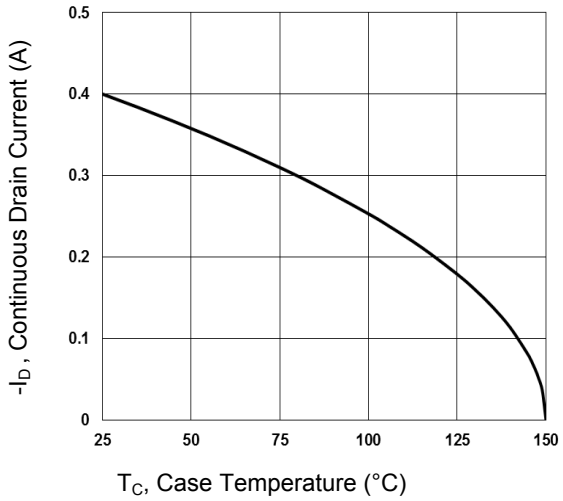


Figure 7. Continuous Drain Current vs.T_C

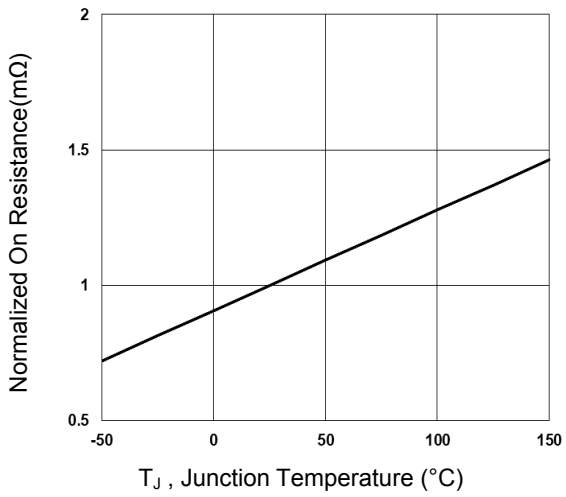


Figure 8. Normalized R_{DSON} vs. T_J

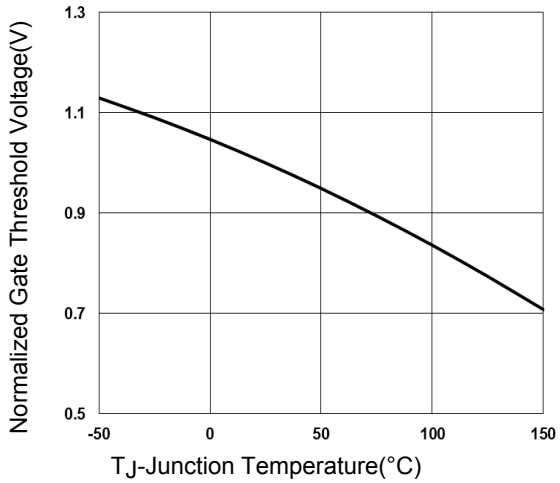


Figure 9. Normalized V_{th} VS T_J

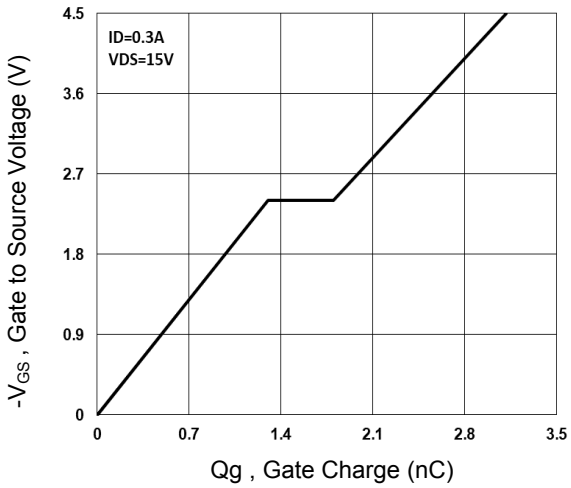


Figure 10. Gate Charge Waveform

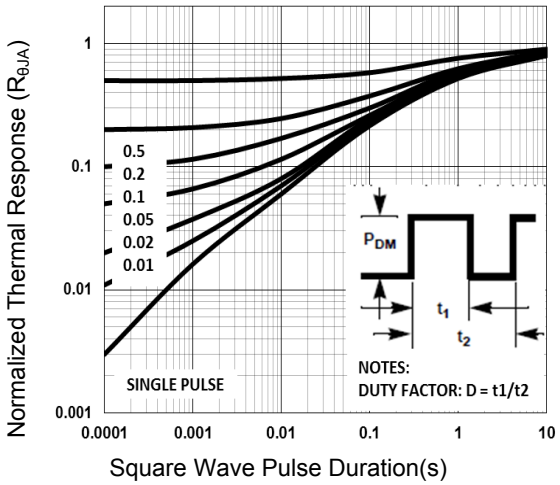


Figure 11. Normalized Transient Impedance

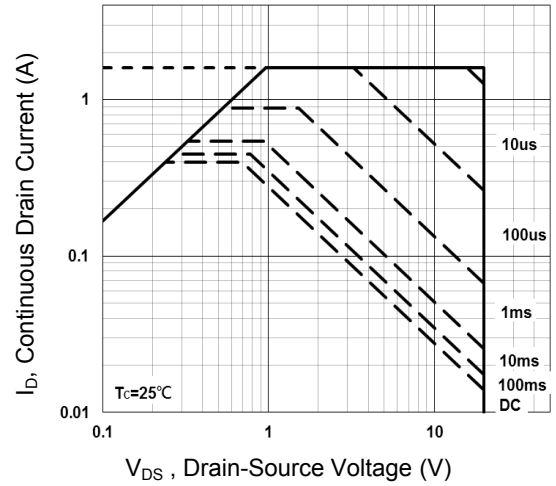
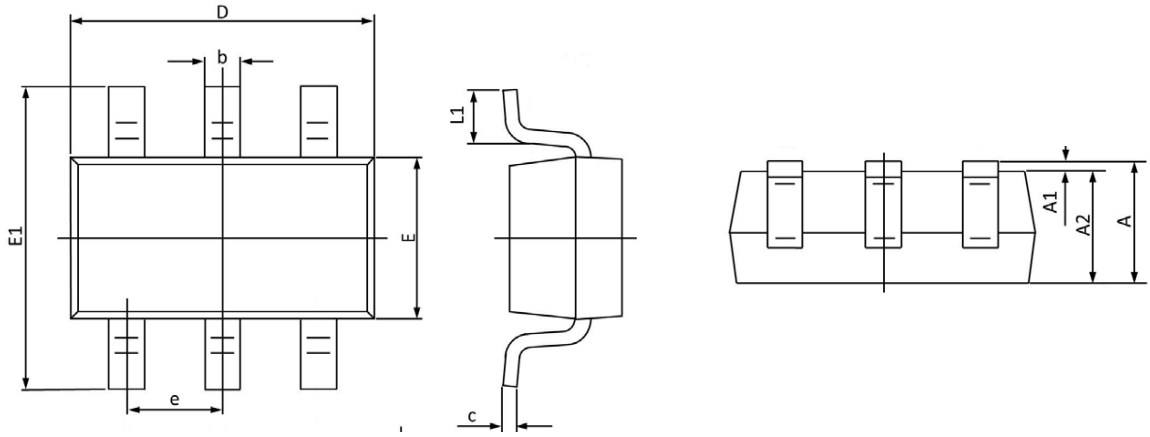


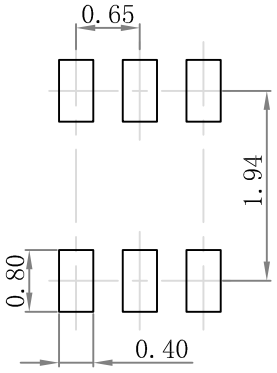
Figure 12. Maximum Safe Operation Area

Package Outline Dimensions (SOT-363)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	1.100	0.800	0.043	0.031
A1	0.100	0.000	0.004	0.000
A2	1.000	0.800	0.039	0.031
b	0.330	0.100	0.013	0.004
c	0.250	0.100	0.010	0.004
D	2.200	1.800	0.087	0.071
E	1.350	1.150	0.053	0.045
E1	2.400	1.800	0.094	0.071
e	0.65BSC		0.026BSC	
L1	0.350	0.100	0.014	0.004

Recommended Pad Layout



Note:
1.Controlling dimension:in millimeters.
2.General tolerance:± 0.05mm.
3.The pad layout is for reference purposes only.