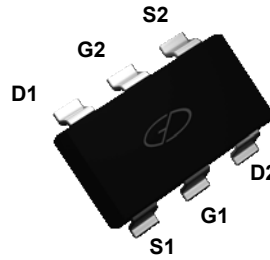
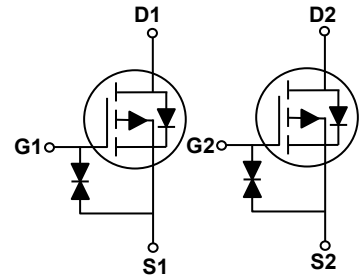


Main Product Characteristics

BV_{DSS}	-50V
$R_{DS(ON)}$	2.6Ω @-10V (Typ)
	3.2Ω @-4.5V (Typ)
I_D	-0.18A



SOT-363



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 GSFK0501E 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	Max.	Unit
Drain-Source Voltage	V_{DS}	-50	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous ($T_A=25^\circ\text{C}$)	I_D	-0.18	A
Drain Current-Continuous ($T_A=70^\circ\text{C}$)		-0.14	
Drain Current-Pulsed ($T_A=25^\circ\text{C}$) ¹	I_{DM}	-1.2	A
Power Dissipation ($T_A=25^\circ\text{C}$)	P_D	0.3	W
Power Dissipation ($T_A=70^\circ\text{C}$)		0.24	
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	400	°C/W
Operating Junction Temperature Range	T_J	-50 To +150	°C
Storage Temperature Range	T_{STG}	-50 To +150	°C

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-50	-	-	V
Zero Gate Voltage Drain Current, $T_A=25^{\circ}\text{C}$	I_{DSS}	$V_{DS}=-50V, V_{GS}=0V$	-	-	-1	μA
Zero Gate Voltage Drain Current, $T_A=125^{\circ}\text{C}$		$V_{DS}=-40V, V_{GS}=0V$	-	-	-100	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 10	μA
On Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=-250\mu A$	-1.0	-2.0	-3.0	V
Drain-Source On-State Resistance ²	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-0.15A$	-	2.6	4	Ω
		$V_{GS}=-4.5V, I_D=-0.15A$	-	3.2	6	Ω
Dynamic and Switching Characteristics						
Total Gate Charge	Q_g	$V_{DS}=-30V, V_{GS}=-10V, I_D=-0.2A$	-	0.53	-	nC
Gate-Source Charge	Q_{gs}		-	0.14	-	
Gate-Drain Charge	Q_{gd}		-	0.1	-	
Turn-On Delay Time	$T_{d(on)}$	$V_{DD}=-30V, V_{GS}=-10V, R_G=3.3\Omega, I_D=-0.1A$	-	1.6	-	nS
Rise Time	T_r		-	5.2	-	
Turn-Off Delay Time	$T_{d(off)}$		-	12	-	
Fall Time	T_f		-	6.1	-	
Input Capacitance	C_{iss}	$V_{DS}=-25V, V_{GS}=0V, F=1\text{MHz}$	-	25.2	-	pF
Output Capacitance	C_{oss}		-	5.9	-	
Reverse Transfer Capacitance	C_{rss}		-	1.4	-	
Drain-Source Diode Characteristics and Maximum Ratings						
Source Drain Current (Body Diode)	I_{SD}	$T_A=25^{\circ}\text{C}$	-	-	-0.18	A
Diode Forward Voltage ²	V_{SD}	$V_{GS}=0V, I_{SD}=-0.1A, T_J=25^{\circ}\text{C}$	-	-	-1.2	V

Note:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2. Pulse test: pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

Typical Electrical and Thermal Characteristic Curves

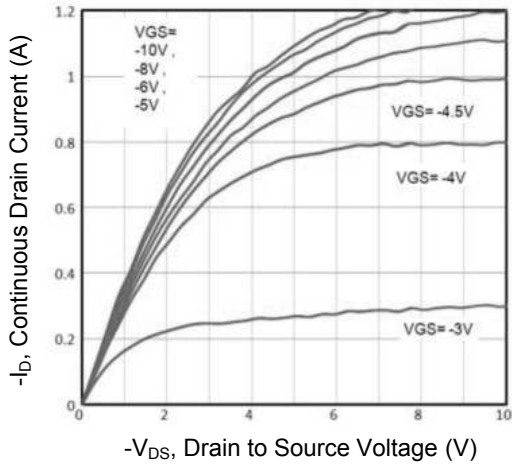


Figure 1. Typical Output Characteristics

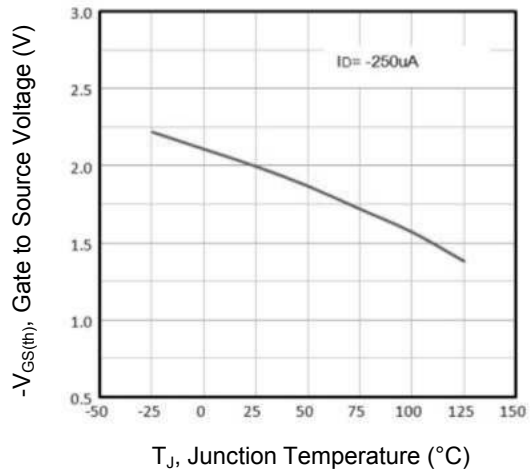


Figure 2. Normalized Threshold Voltage vs. T_J

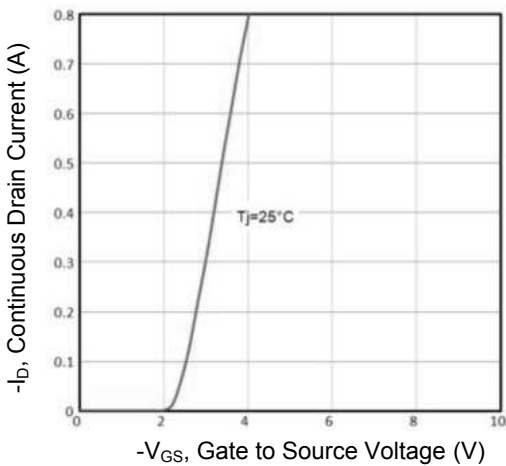


Figure 3. Typical Transfer Characteristics

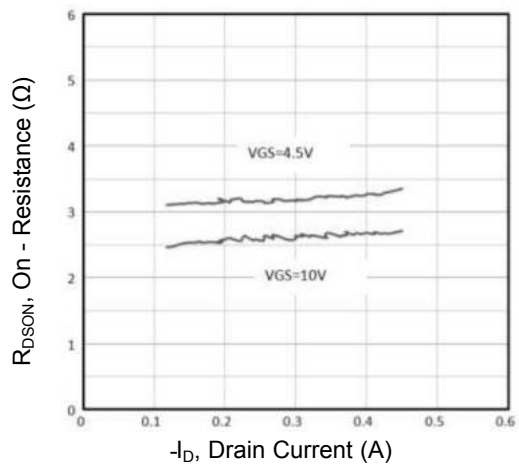


Figure 4. On-Resistance vs. Drain Current

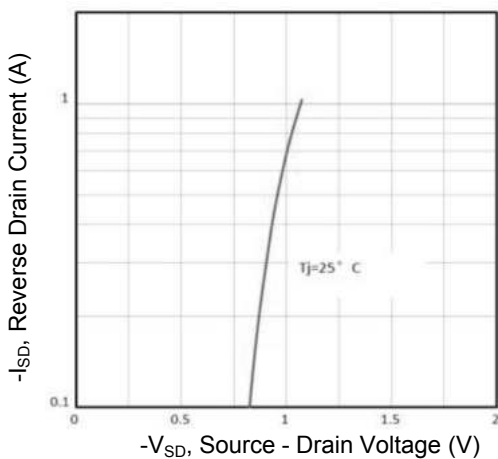


Figure 5. Typical Source - Drain Diode Forward Voltage

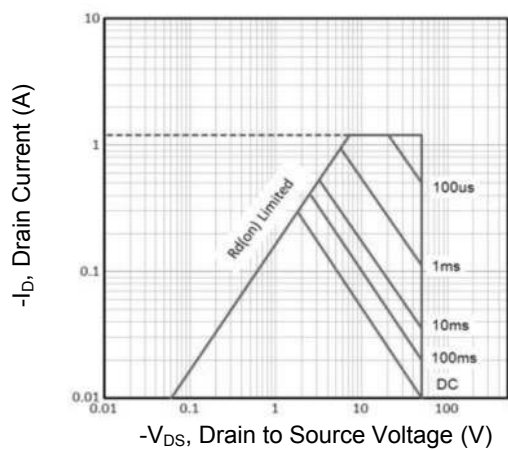


Figure 6. Maximum Safe Operating Area

Typical Electrical and Thermal Characteristic Curves

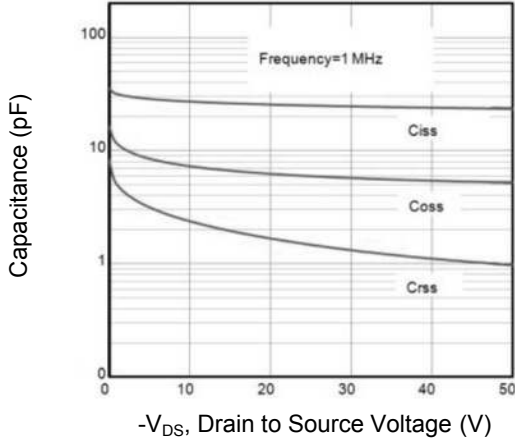


Figure 7. Typical Capacitance vs. Drain - Source Voltage

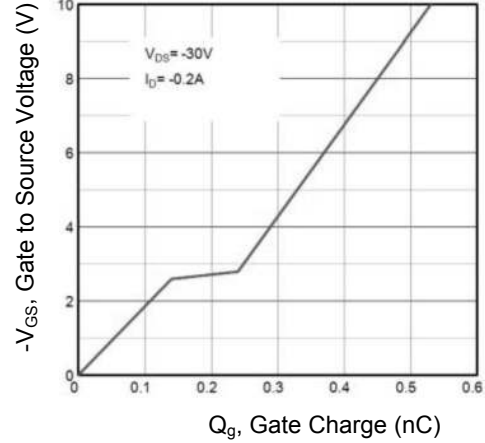


Figure 8. Gate Charge Characteristics

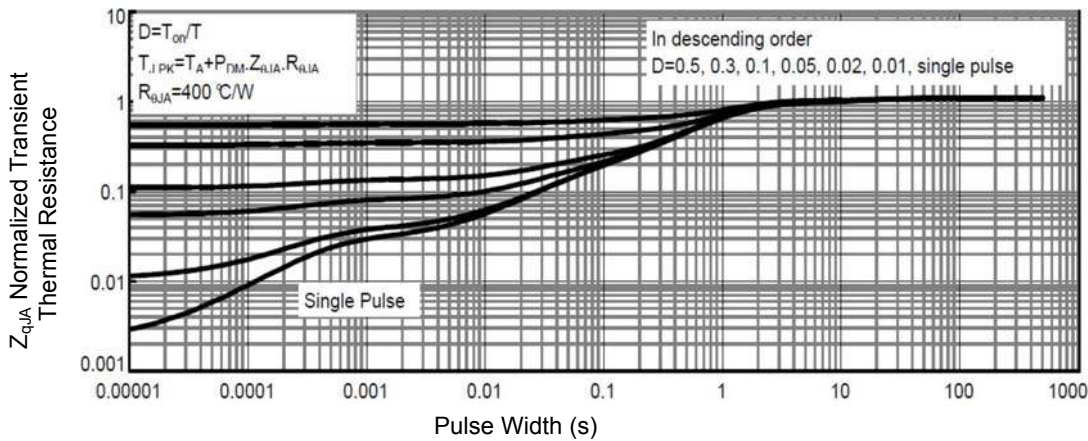


Figure 9. Normalized Maximum Transient Thermal Impedance

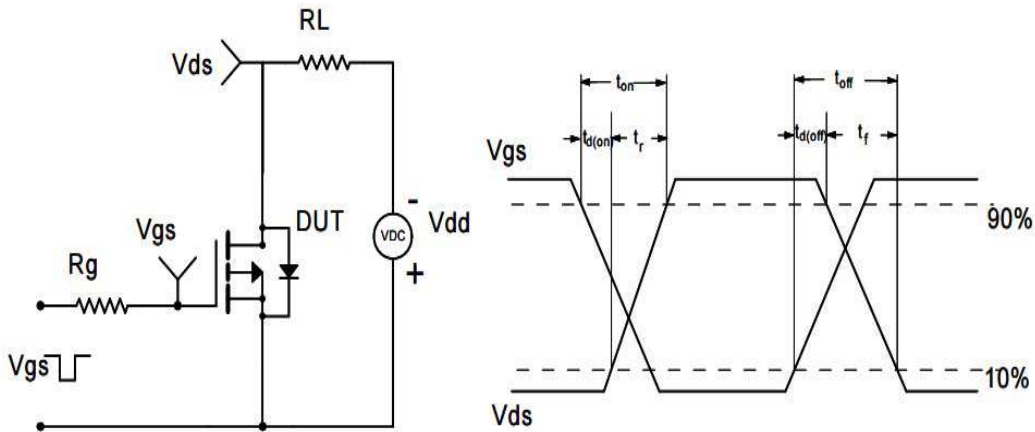
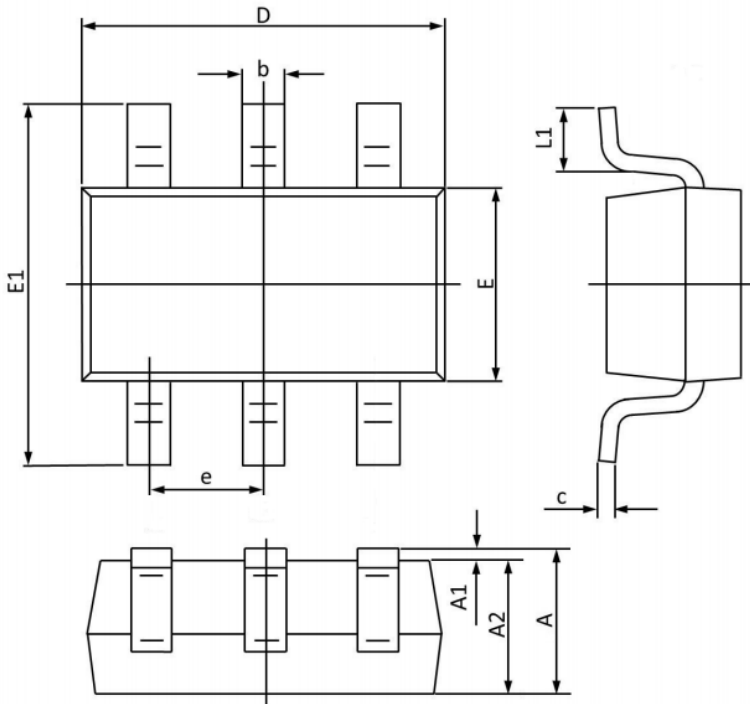


Figure 10. Switching Time Test Circuit and Waveforms

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	0.330	0.004	0.013
c	0.100	0.250	0.004	0.010
D	1.800	2.200	0.071	0.087
E	1.150	1.350	0.045	0.053
E1	1.800	2.400	0.071	0.094
e	0.65 BSC		0.026 BSC	
L1	0.100	0.350	0.004	0.014

Order Information

Device	Package	Marking Code	Quantity	HSF Status
GSFK0501E	SOT-363	84K	3000 pcs / Reel	RoHS Compliant