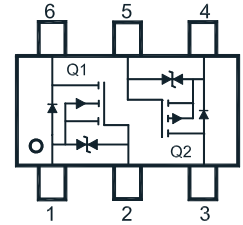


### Main Product Characteristics

Polarity	N-Ch	P-Ch
$BV_{DSS}$	60V	-60V
$R_{DS(ON)}$	4Ω (Max)	7Ω (Max)
$I_D$	300mA	-160mA



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 GSF06003 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 ( $T_A=25^{\circ}C$ unless otherwise specified)

Parameter	Symbol	Value		Unit
		N-Channel	P-Channel	
Drain-Source Voltage	$V_{DS}$	60	-60	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	$\pm 20$	V
Continuous Drain Current	$I_D$	300	-160	mA
Drain Current (Pulse Width $\leq 10\mu s$ )	$I_{DM}$	1.2	-0.64	A
Total Power Dissipation <sup>1</sup>	$P_{tot}$	250		mW
Max. Thermal Resistance from Junction to Ambient <sup>1</sup>	$R_{\theta JA}$	500		$^{\circ}C/W$
Operating Junction and Storage Temperature Range	$T_J/T_{STG}$	-55 to +150		$^{\circ}C$

Note:

1. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.

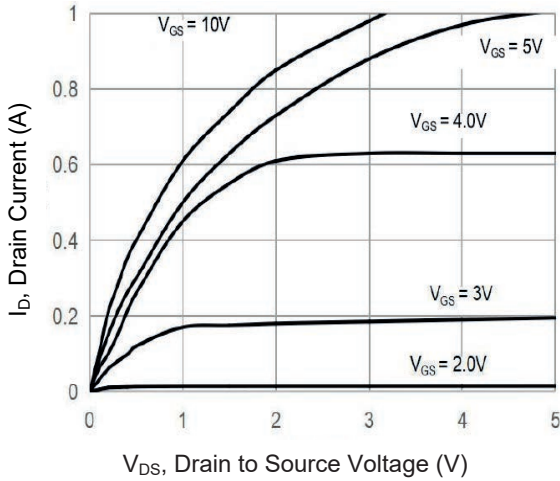
### N-Channel Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>On / Off Characteristics</b>						
Drain Source Breakdown Voltage	BV <sub>DSS</sub>	I <sub>D</sub> =250μA	60	-	-	V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =60V	-	-	1	μA
Gate Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V	-	-	±10	μA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1	-	2	V
Static Drain Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =300mA	-	-	3	Ω
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =200mA	-	-	4	
<b>Dynamic and Switching Characteristics</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =30V, f=1MHz	-	28	-	pF
Output Capacitance	C <sub>oss</sub>		-	11	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	4	-	
Gate Charge Total	Q <sub>g</sub>	V <sub>DS</sub> =30V, I <sub>D</sub> =300mA, V <sub>GS</sub> =4.5V	-	1.7	-	nC
Gate to Source Charge	Q <sub>gs</sub>		-	0.3	-	
Gate to Drain Charge	Q <sub>gd</sub>		-	0.6	-	
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DS</sub> =30V, V <sub>GS</sub> =10V, I <sub>D</sub> =300mA, R <sub>G</sub> =3.3Ω	-	2	-	nS
Turn-On Rise Time	t <sub>r</sub>		-	15	-	
Turn-Off Delay Time	t <sub>d(off)</sub>		-	7	-	
Turn-Off Fall Time	t <sub>f</sub>		-	20	-	
<b>Source-Drain Ratings and Characteristics</b>						
Drain-Source Diode Forward Voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =300mA	-	-	1.2	V
Body-Diode Continuous Current	I <sub>S</sub>	-	-	-	300	mA

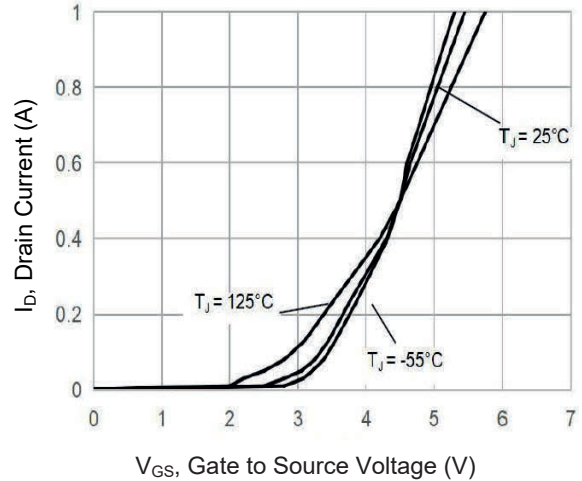
### P-Channel Electrical Characteristics ( $T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>On / Off Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=-250\mu\text{A}$	-60	-	-	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-60\text{V}$	-	-	-1	$\mu\text{A}$
Gate-Source Leakage	$I_{GSS}$	$V_{GS}=\pm 20\text{V}$	-	-	$\pm 10$	$\mu\text{A}$
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu\text{A}$	-1	-	-2.2	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=-10\text{V}, I_D=-150\text{mA}$	-	-	6	$\Omega$
		$V_{GS}=-4.5\text{V}, I_D=-100\text{mA}$	-	-	7	
Forward Transconductance	$g_{fs}$	$V_{DS}=-5\text{V}, I_D=-100\text{mA}$	-	0.2	-	S
<b>Dynamic and Switching Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{GS}=0\text{V}, V_{DS}=-30\text{V}, f=1\text{MHz}$	-	19	-	pF
Output Capacitance	$C_{oss}$		-	9	-	
Reverse Transfer Capacitance	$C_{rss}$		-	5.4	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=-30\text{V}, V_{GS}=-10\text{V}, I_D=-150\text{mA}, R_G=3.3\Omega$	-	4	-	nS
Turn-On Rise Time	$t_r$		-	3	-	
Turn-Off Delay Time	$t_{d(off)}$		-	6	-	
Turn-Off Fall Time	$t_f$		-	75	-	
<b>Source-Drain Ratings and Characteristics</b>						
Drain-Source Diode Forward Voltage	$V_{SD}$	$I_S=-150\text{mA}$	-	-	-1.2	V
Body-Diode Continuous Current	$I_S$	-	-	-	-160	mA

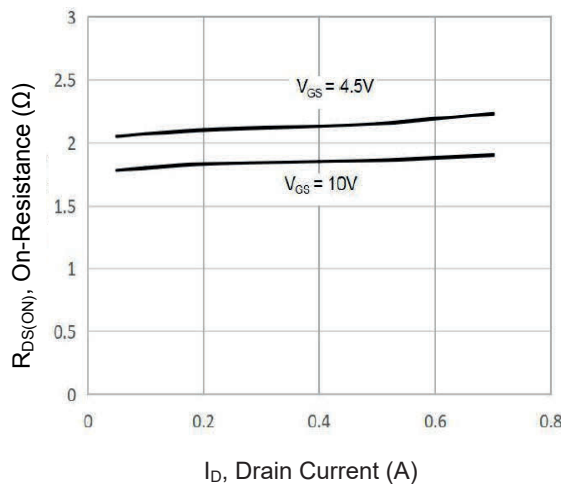
### N-Channel Typical Electrical and Thermal Characteristic Curves



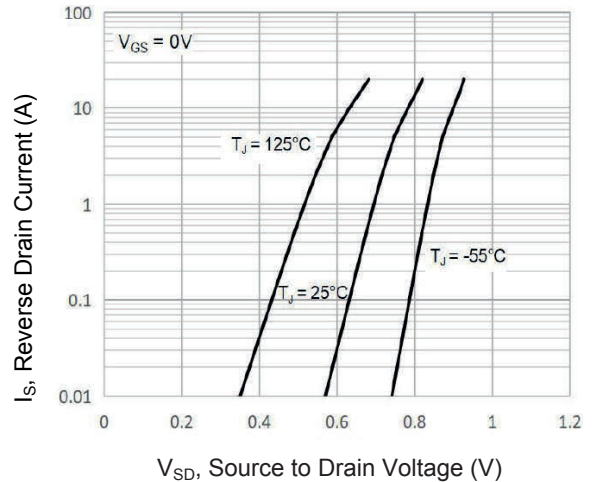
**Figure 1. Typical Output Characteristics**



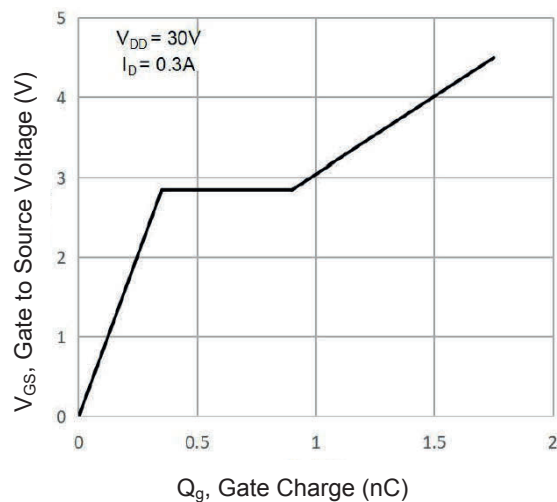
**Figure 2. Typical Transfer Characteristics**



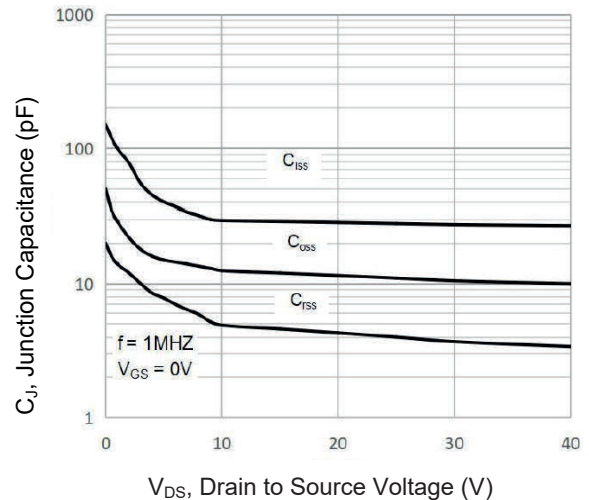
**Figure 3. On-Resistance vs. Drain Current**



**Figure 4. Typical Body-Diode Forward Characteristics**

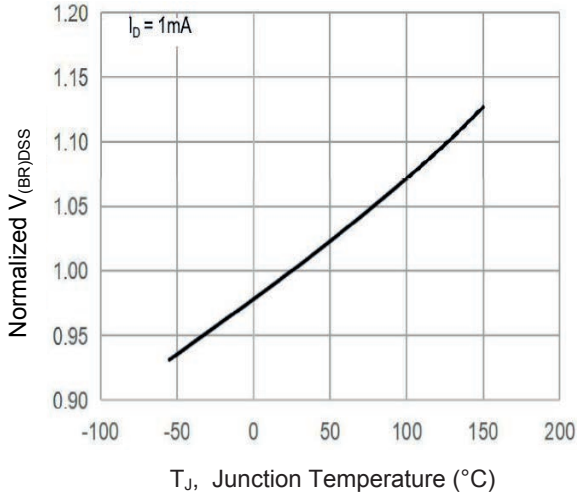


**Figure 5. Gate Charge**



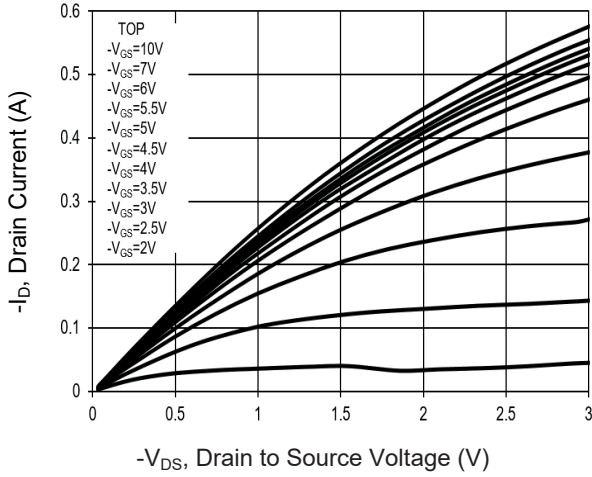
**Figure 6. Typical Junction Capacitance**

## N-Channel Typical Electrical and Thermal Characteristic Curves

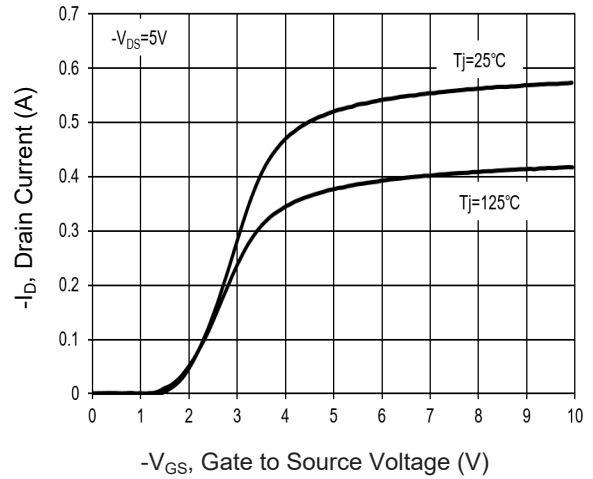


**Figure 7. V<sub>(BR)DSS</sub> vs. Junction Temperature**

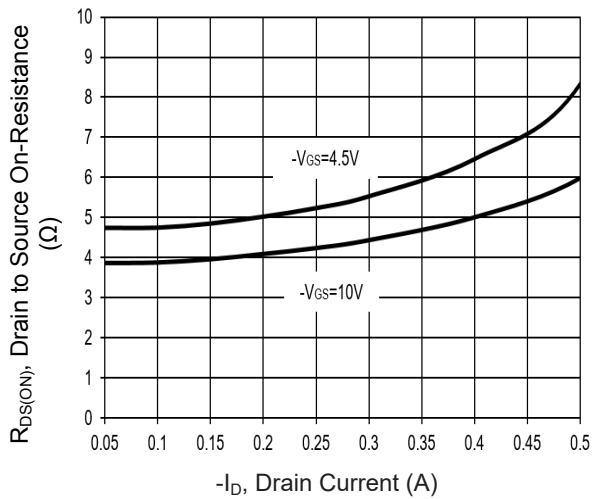
### P-Channel Typical Electrical and Thermal Characteristic Curves



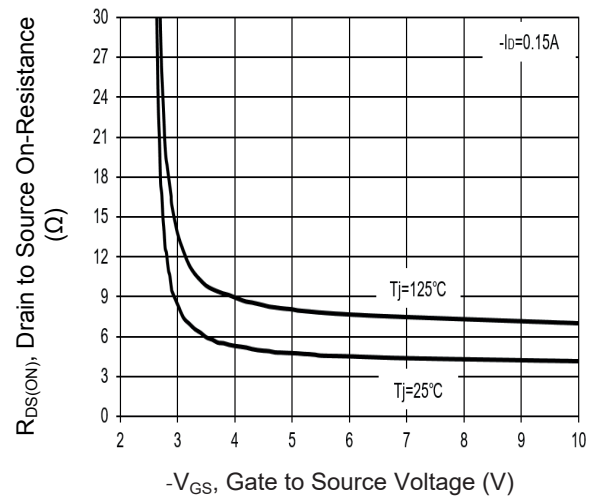
**Figure 1. Typical Output Characteristics**



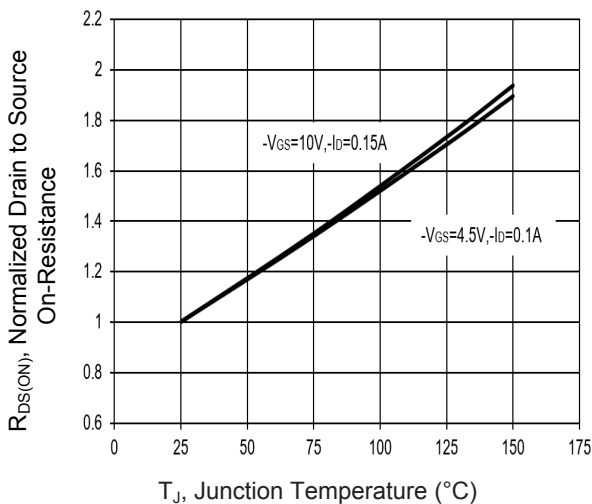
**Figure 2. Typical Transfer Characteristics**



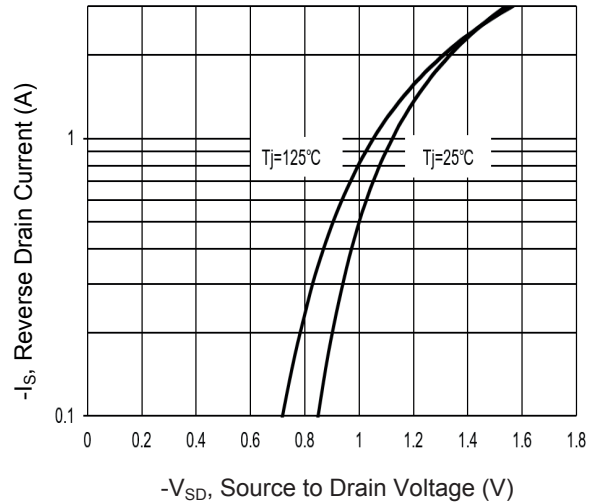
**Figure 3. On-Resistance vs. Drain Current**



**Figure 4. On-Resistance vs. Gate to Source Voltage**

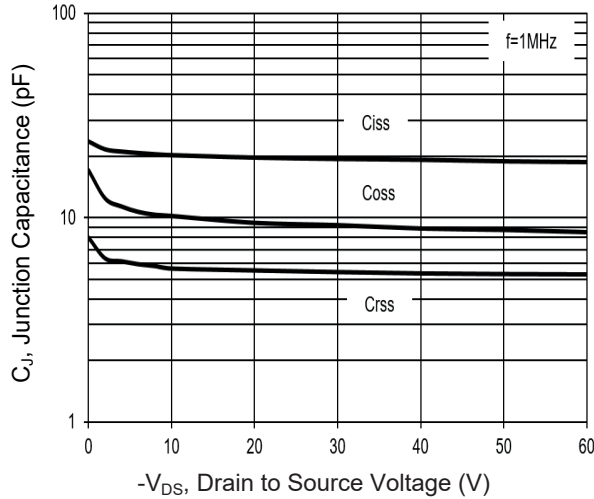


**Figure 5. On-Resistance vs.  $T_j$**

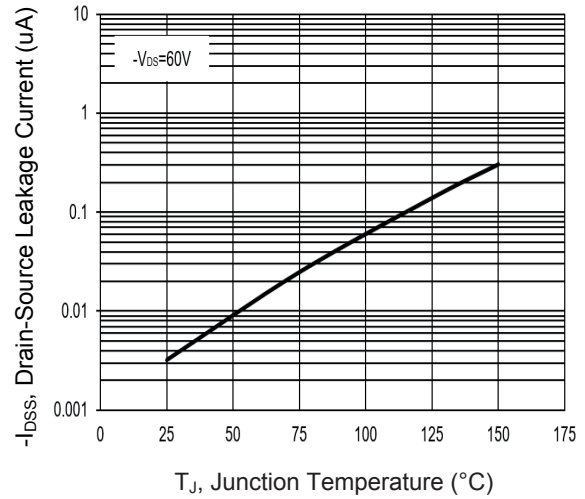


**Figure 6. Typical Body-Diode Forward Characteristics**

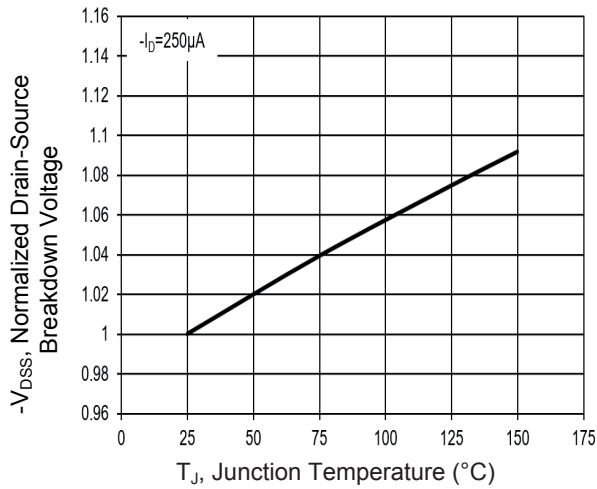
### P-Channel Typical Electrical and Thermal Characteristic Curves



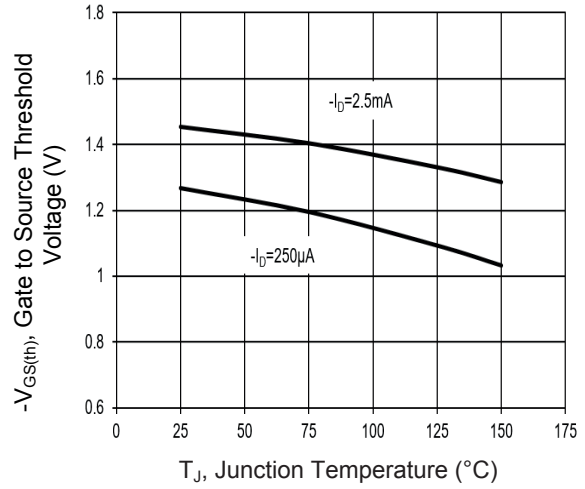
**Figure 7. Typical Junction Capacitance**



**Figure 8. Drain-Source Leakage Current vs.  $T_J$**

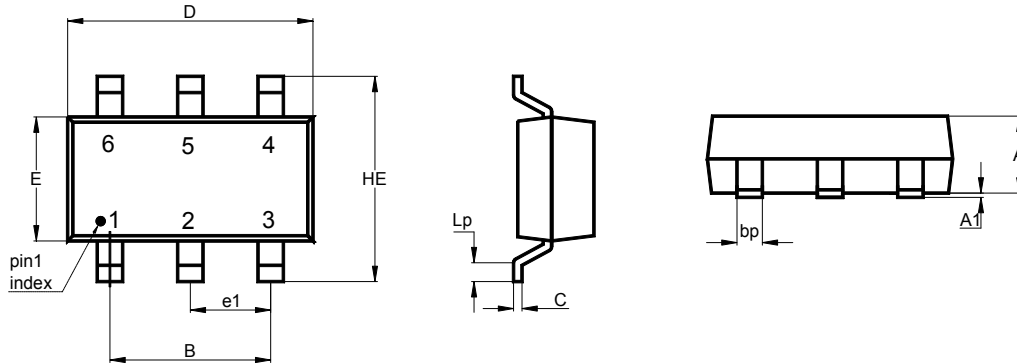


**Figure 9.  $V_{(BR)DSS}$  vs. Junction Temperature**



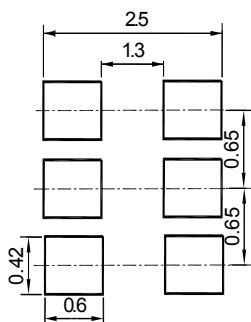
**Figure 10. Gate Threshold Variation vs.  $T_J$**

## Package Outline Dimensions (SOT-363)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.90	1.00	0.035	0.039
A1	0.00	0.10	0.000	0.004
B	1.30 TYP		0.051 TYP	
C	0.10	0.25	0.004	0.010
D	1.80	2.20	0.071	0.087
E	1.15	1.35	0.045	0.053
e1	0.65 TYP		0.026 TYP	
HE	2.00	2.20	0.079	0.087
Lp	0.15	0.40	0.006	0.016
bp	0.10	0.30	0.004	0.012

## Recommended Pad Layout



unit: mm

## Order Information

Device	Package	Marking	Carrier	Quantity
GSFK06003	SOT-363	QY	Tape & Reel	3,000 Pcs / Reel

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