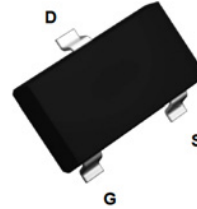
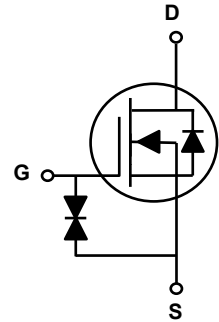


Main Product Characteristics

$V_{(BR)DSS}$	600V
$R_{DS(ON)}$	500Ω (max.)
I_D	0.03A



SOT-23



Schematic Diagram

Features and Benefits

- Advanced Depletion 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 GSFC601DPE 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	Max.	Unit
Drain-Source Voltage	V_{DS}	600	V
Gate-to-Source Voltage	V_{GS}	±20	V
Continuous Drain Current, @ Steady-State ($T_C=25^{\circ}\text{C}$)	I_D	0.03	A
Continuous Drain Current, @ Steady-State ($T_C=70^{\circ}\text{C}$)		0.024	A
Pulsed Drain Current	I_{DM}	0.12	A
Power Dissipation ($T_C=25^{\circ}\text{C}$)	P_D	0.8	W
		6.4	mW/°C
Thermal Resistance, Junction-to-Ambient (PCB Mounted, Steady-State)	$R_{\theta JA}$	249	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	150	°C/W
Operating Junction and Storage Temperature Range	T_J/T_{STG}	-55 to +150	°C

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-to-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =-5V, I _D =250μA	600	-	-	V
Drain-to-Source Leakage Current	I _{DSS}	V _{DS} =25V, V _{GS} =0V	12	-	-	mA
Gate-to-Source Forward Leakage	I _{GSS}	V _{DS} =0V, V _{GS} =20V	-	-	10	uA
		V _{DS} =0V, V _{GS} =-20V	-	-	-10	
Static Drain-to-Source On-Resistance	R _{DS(ON)}	V _{GS} =0V, I _D =3mA	-	310	500	Ω
		V _{GS} =10V, I _D =16mA	-	330	500	Ω
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =3V, I _D =8μA	-2.7	-	-1.0	V
Drain-Source Cutoff Current	I _{D(off)}	V _{DS} =600V, V _{GS} =-5V	-	-	0.1	uA
Dynamic and Switching Characteristics						
Input Capacitance	C _{iss}	V _{GS} =-5V, V _{DS} =25V, f=1MHz	-	10.1	-	pF
Output Capacitance	C _{oss}		-	2.94	-	
Reverse Transfer Capacitance	C _{rss}		-	0.12	-	
Total Gate Charge ^{1,2}	Q _g	I _D =0.01A, V _{DS} =400V, V _{GS} =-5V to 7V	-	2.82	-	nC
Gate-to-Source Charge ^{1,2}	Q _{gs}		-	0.55	-	
Gate-to-Drain ("Miller") Charge ^{1,2}	Q _{gd}		-	1.61	-	
Turn-on Delay Time ^{1,2}	t _{d(on)}	V _{DD} =300V, V _{GS} =-5V to 7V, R _G =6Ω, I _D =0.01A	-	12	-	nS
Rise Time ^{1,2}	t _r		-	60	-	
Turn-Off Delay Time ^{1,2}	t _{d(off)}		-	25	-	
Fall Time ^{1,2}	t _f		-	99	-	
Source-Drain Ratings and Characteristics						
Continuous Source Current (Body Diode)	I _S	T _C =25°C, MOSFET symbol showing the integral reverse p-n junction diode.	-	-	0.03	A
Source Pulse Current	I _{SM}		-	-	0.12	A
Diode Forward Voltage	V _{SD}	I _S =16mA, V _{GS} =-5V	-	-	1.2	V
Reverse Recovery Time ²	T _{rr}	I _F =0.01A, V _R =300V, dI _F /d _t =100A/us	-	-	367	nS
Reverse Recovery Charge ²	Q _{rr}		-	-	963	nC

Notes:

1. Pulse test: Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
2. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

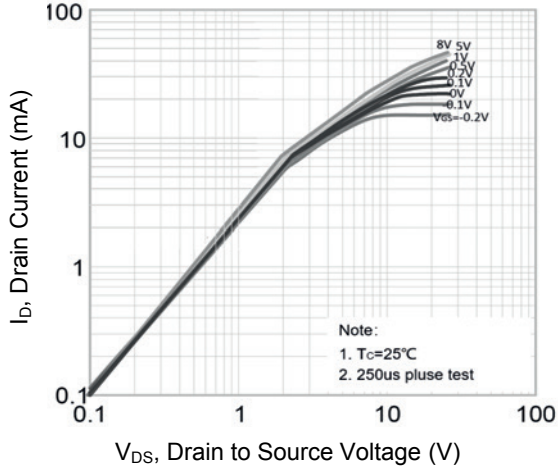


Figure 1. Typical Output Characteristics

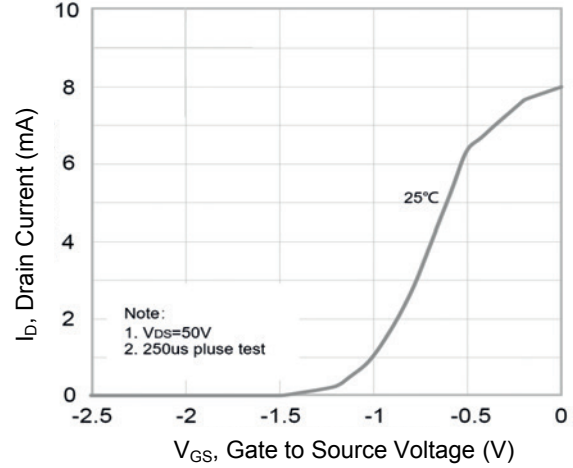


Figure 2. Transfer Characteristics

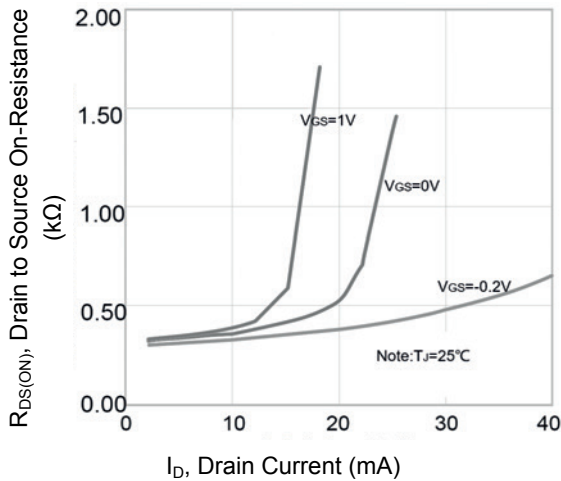


Figure 3. $R_{DS(ON)}$ vs. Drain Current

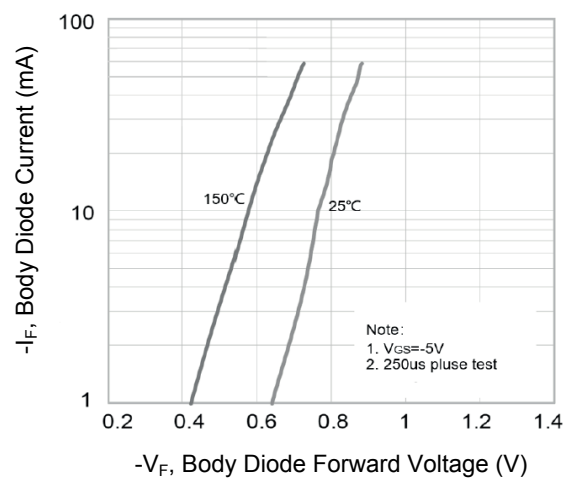


Figure 4. Body Diode Characteristics

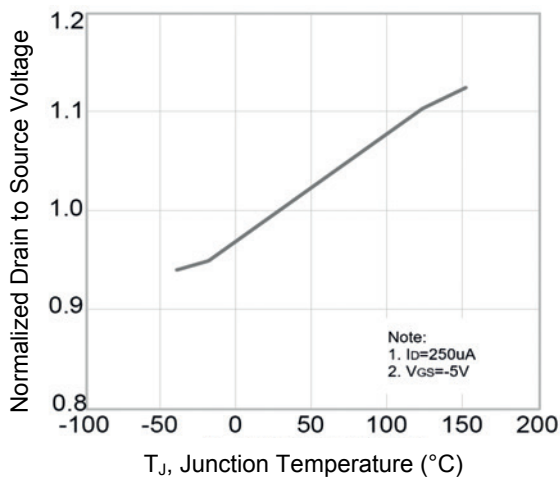


Figure 5. Normalized BV_{DS} vs. T_J

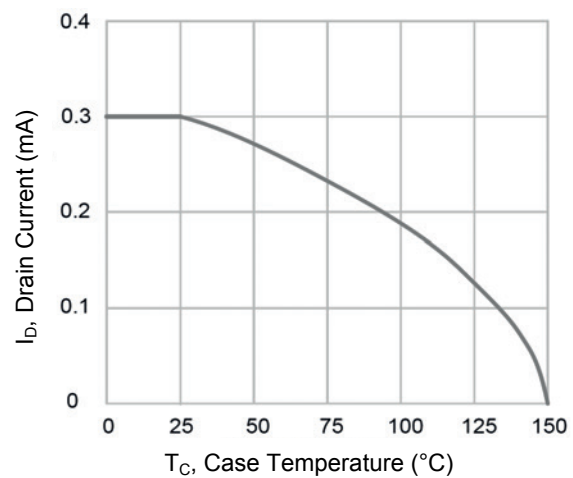


Figure 6. Drain Current vs. T_C

Typical Electrical and Thermal Characteristic Curves

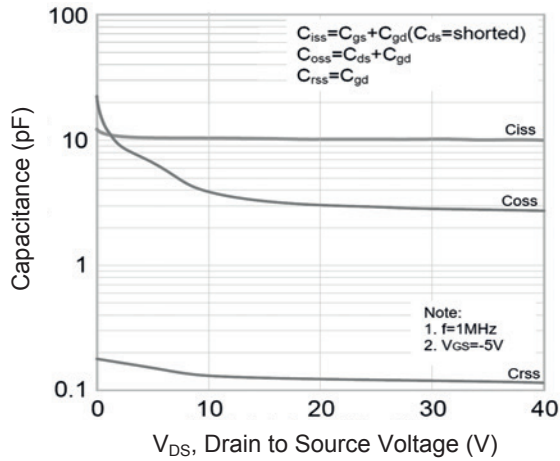


Figure 7. Capacitance Characteristics

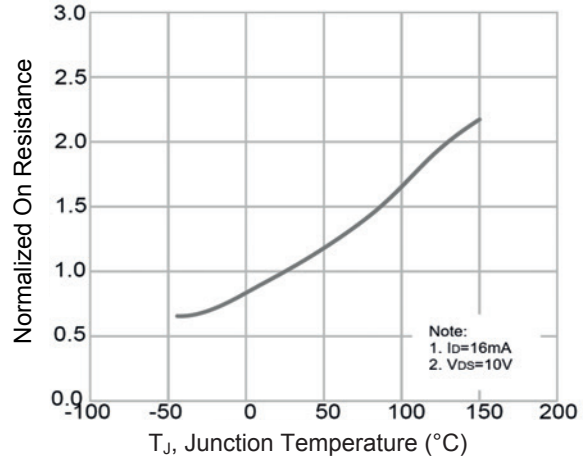


Figure 8. Normalized $R_{DS(ON)}$ vs. T_J

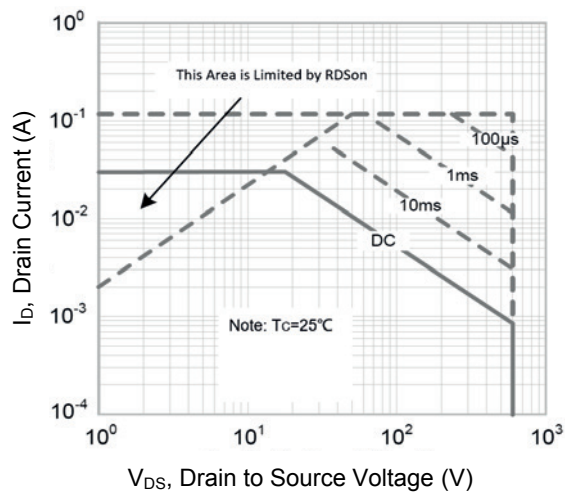
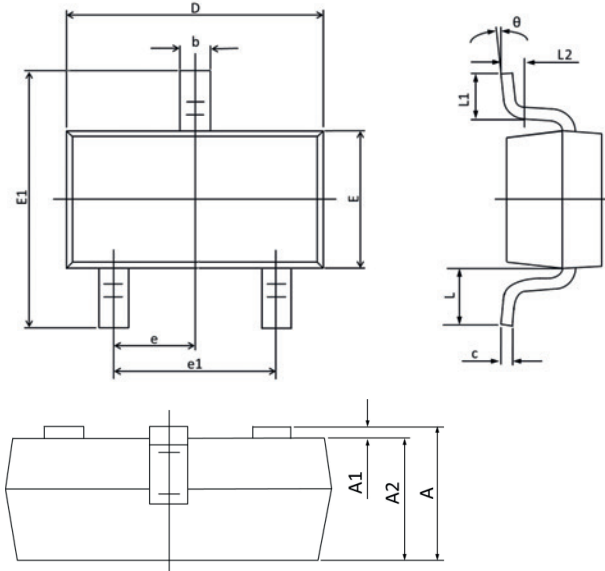


Figure 9. Safe Operation Area

Package Outline Dimensions (SOT-23)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.95 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.55 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
L2	0.25 TYP.		0.01 TYP.	
θ	0°	8°	0°	8°

Order Information

Device	Package	Marking	Carrier	Quantity
GSFC601DPE	SOT-23	601DP	Tape & Reel	3,000 Pcs / Reel