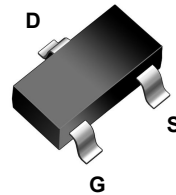
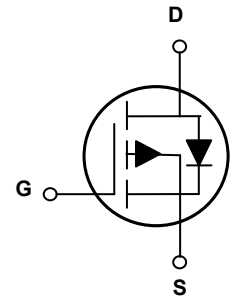


**Main Product Characteristics**

$V_{(BR)DSS}$	-20V
$R_{DS(ON)}$	119mΩ (max.)
$I_D$	-2.0A



SOT-323



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

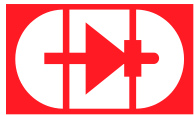


**Description**

The GSFC12303 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	Max.	Unit
Drain-Source Voltage	$V_{DS}$	-20	V
Gate-to-Source Voltage	$V_{GS}$	$\pm 8$	V
Continuous Drain Current, @ Steady-State ( $T_A=25^{\circ}C$ ) <sup>1</sup>	$I_D$	-2.0	A
Continuous Drain Current, @ Steady-State ( $T_A=70^{\circ}C$ )		-1.6	A
Pulsed Drain Current <sup>2</sup>	$I_{DM}$	-8	A
Power Dissipation ( $T_A=25^{\circ}C$ )	$P_D$	0.45	W
Linear Derating Factor ( $T_A=25^{\circ}C$ )		3.6	mW/ $^{\circ}C$
Junction-to-Ambient (PCB Mounted, Steady-State) <sup>3</sup>	$R_{\theta JA}$	280	$^{\circ}C/W$
Operating Junction and Storage Temperature Range	$T_J/T_{STG}$	-55 to +150	$^{\circ}C$

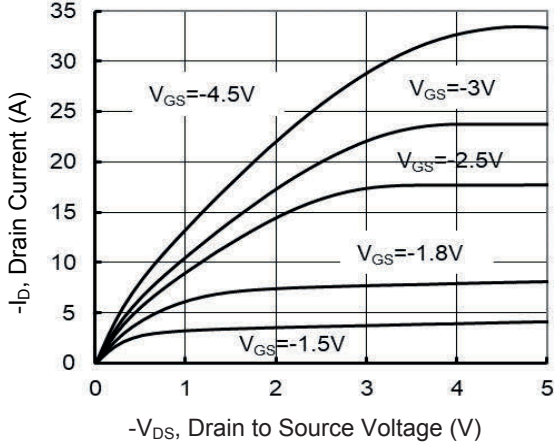

**Electrical Characteristics** ( $T_A=25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>On / Off Characteristics</b>						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-20	-	-	V
Drain-to-Source Leakage Current	$I_{DSS}$	$V_{DS}=-20V, V_{GS}=0V$	-	-	-1	$\mu A$
		$T_J=125^\circ\text{C}$	-	-	-50	
Gate-to-Source Forward Leakage	$I_{GSS}$	$V_{GS}=8V$	-	-	100	nA
		$V_{GS}=-8V$	-	-	-100	
Static Drain-to-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=-4.5V, I_D=-2.0A$	-	82	119	m $\Omega$
		$V_{GS}=-2.5V, I_D=-1.0A$	-	100	119	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.4	-0.62	-1.0	V
Forward Transconductance	$g_{fs}$	$V_{DS}=5V, I_D=-2.0A$	-	11	-	S
<b>Dynamic and Switching Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{GS}=0V, V_{DS}=-10V,$ $f=1\text{MHz}$	-	438	-	pF
Output Capacitance	$C_{oss}$		-	76	-	
Reverse Transfer Capacitance	$C_{rss}$		-	63	-	
Total Gate Charge	$Q_g$	$I_D=-2.0A, V_{DS}=-10V,$ $V_{GS}=-10V$	-	5.4	-	nC
Gate-to-Source Charge	$Q_{gs}$		-	1.2	-	
Gate-to-Drain ("Miller") Charge	$Q_{gd}$		-	1.3	-	
Turn-on Delay Time	$t_{d(on)}$	$V_{GS}=-4.5V, V_{DS}=-10V,$ $I_D=-1A, R_G=3.0\Omega$	-	6.5	-	nS
Rise Time	$t_r$		-	21	-	
Turn-Off Delay Time	$t_{d(off)}$		-	37	-	
Fall Time	$t_f$		-	34	-	
Gate Resistance	$R_g$	$f=1\text{MHz}$	-	5.1	-	$\Omega$
<b>Source-Drain Ratings and Characteristics</b>						
Continuous Source Current (Body Diode)	$I_S$	MOSFET symbol showing the integral reverse p-n junction diode.	-	-	-2.0	A
Pulsed Source Current (Body Diode)	$I_{SM}$		-	-	-8	A
Diode Forward Voltage	$V_{SD}$	$I_S=-1.0A, V_{GS}=0V$	-	-0.9	-1.2	V

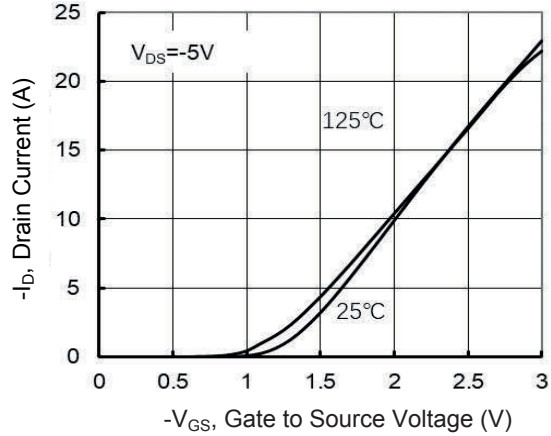
## Notes:

1. Pulse test: Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
2. Repetitive rating; pulse width limited by max. junction temperature.
3. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

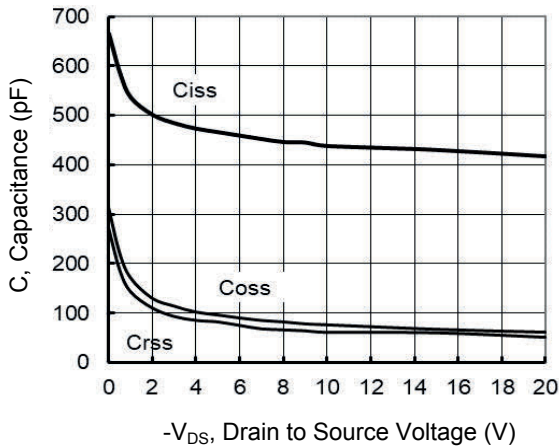
**Typical Electrical and Thermal Characteristic Curves**



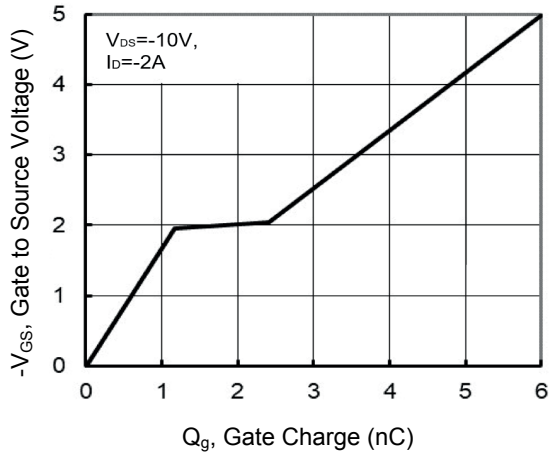
**Figure 1. Typical Output Characteristics**



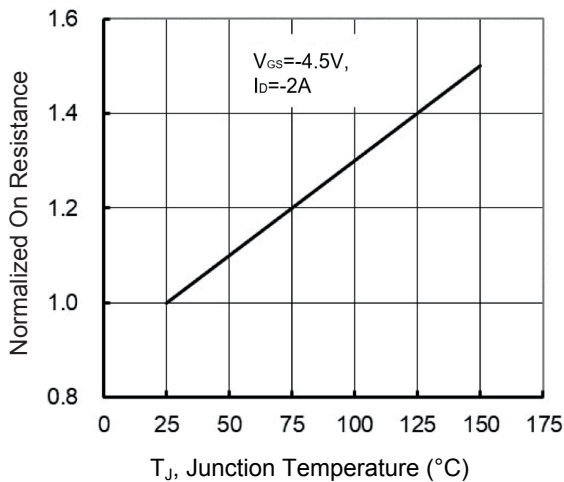
**Figure 2. Typical Transfer Characteristics**



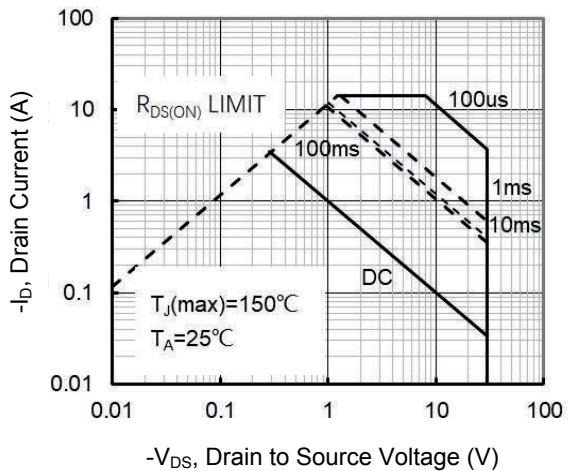
**Figure 3. Capacitance vs. Drain to Source Voltage**



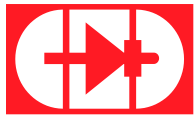
**Figure 4. Gate Charge**



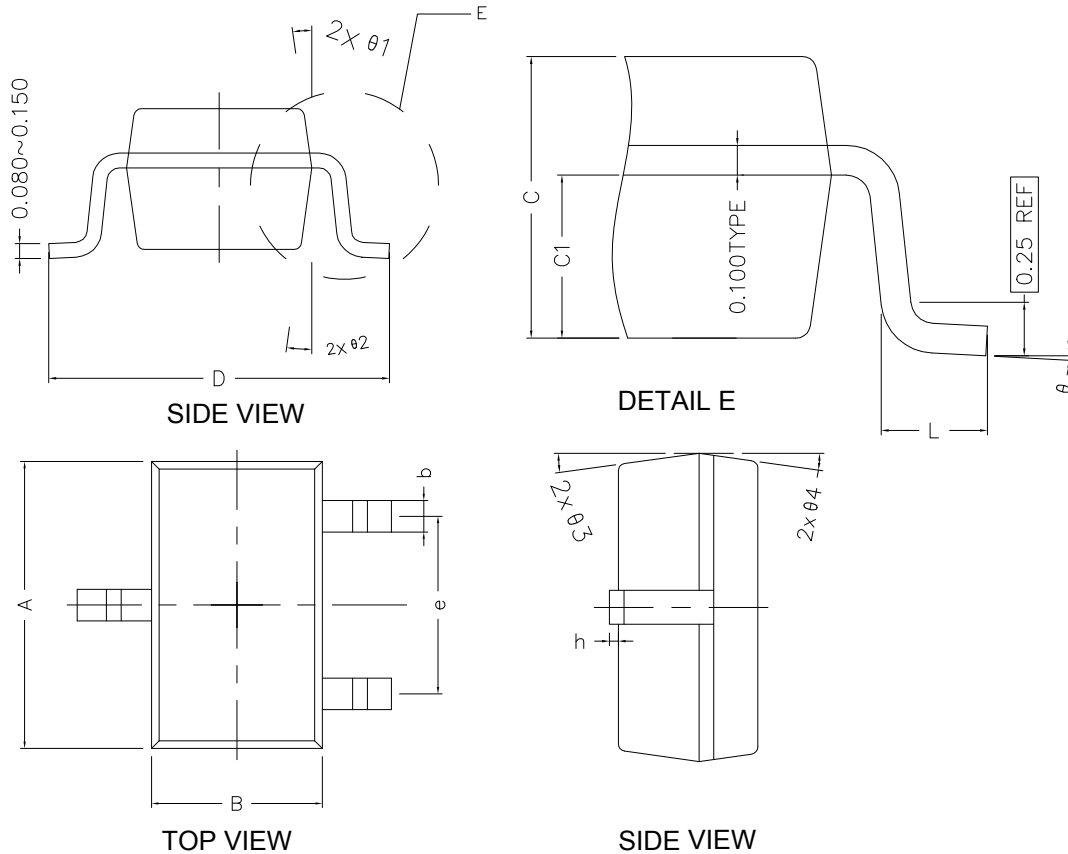
**Figure 5. Normalized  $R_{DS(ON)}$  vs.  $T_J$**



**Figure 6. Safe Operation Area**



Package Outline Dimensions (SOT-323)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.00	2.20	0.079	0.087
B	1.15	1.35	0.045	0.053
C	0.90	1.00	0.035	0.039
C1	0.50	0.60	0.020	0.024
D	2.10	2.50	0.083	0.098
L	0.22	0.50	0.009	0.020
b	0.20	0.40	0.008	0.016
h	0.02	0.10	0.001	0.004
e	1.30 TYP		0.051 TYP	
θ1	8° TYP		8° TYP	
θ2	8° TYP		8° TYP	
θ3	8° TYP		8° TYP	
θ4	8° TYP		8° TYP	
θ	0°	8°	0°	8°