BSP129

N-Channel Enhancement Mode Field Effect Transistor

- **Features**

V_{DS} (V) = 240V

I_D = 2A (V_{GS} = 10V)

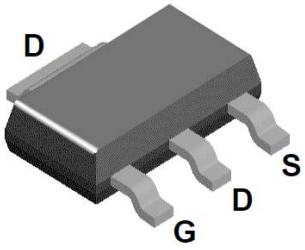
$R_{DS(ON)}$ < 410mΩ (V_{GS} = 10V)

$R_{DS(ON)}$ < 820mΩ (V_{GS} = 6V)

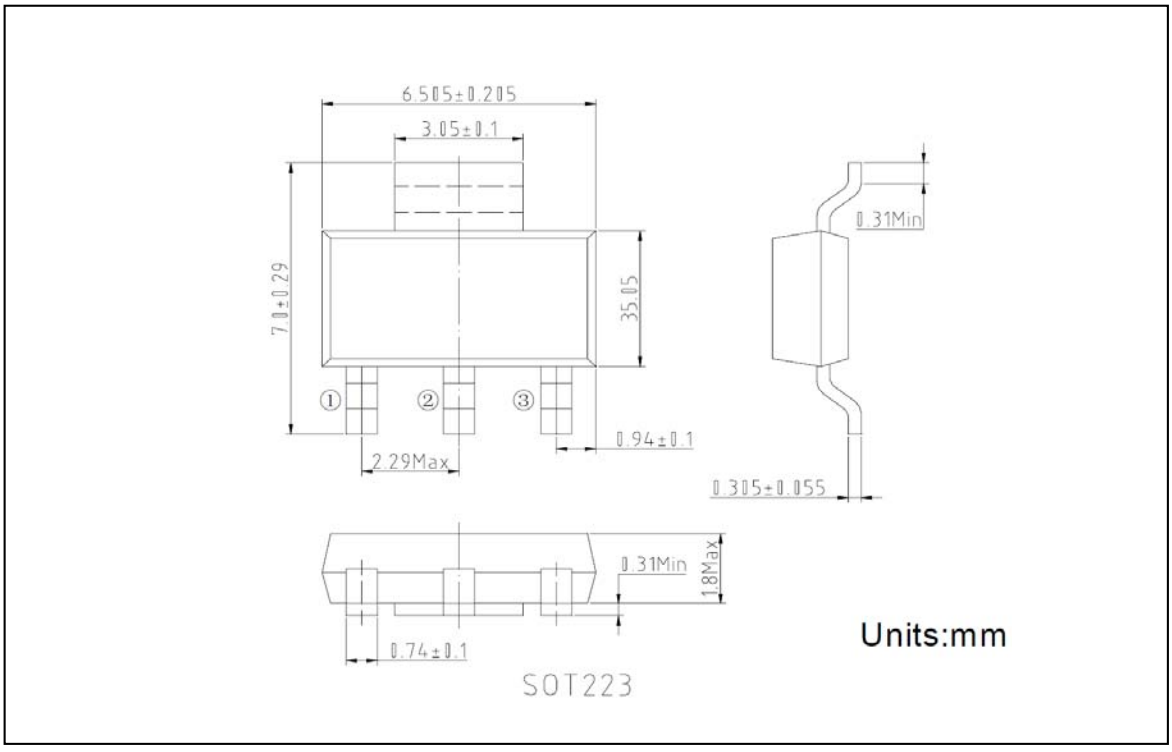
- **General Description**

The LT1596SO uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. This device is suitable for use as a load switch or in PWM applications. The source leads are separated to allow a Kelvin connection to the source, which may be used to bypass the source inductance.

- **Pin Configurations**



- **Package Information**



- **Absolute Maximum Ratings** @T_A=25℃ unless otherwise noted

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DSS}	240	V

Gate-Source Voltage		V_{GSS}	±20	V
Drain Current (Continuous) *AC	T_A=25°C	I_D	2	A
	T_A=70°C		1.5	
Drain Current (Pulse) *B		I_{DM}	10	A
Power Dissipation	T_A=25°C	P_D	18	W
	T_A=70°C		13	
Operating Temperature/ Storage Temperature		T_{J}/T_{STG}	-55~150	℃

- **Electrical Characteristics** @T_A=25℃ unless otherwise noted

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	240	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 200 V, V_{GS} = 0V	--	--	1	μA
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} = V_{DS}, I_{DS} = 250μA	2	2.8	4	V
Gate Leakage Current	I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V	--	--	100	nA
Drain-Source On-state Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 2A	--	310	410	mΩ
		V_{GS} = 6V, I_D = 1A	--	450	820	mΩ
Diode Forward Voltage	V_{SD}	I_{SD} =1A , V_{GS}=0V	--	0.7	1.15	V
Maximum Body-Diode Continuous Current	I_S		--	--	2	A
Switching						
Total Gate Charge	Q_g	V_{GS}=10V, V_{DS}=160V, I_D=9A	--	51.7	--	nC
Gate-Source Charge	Q_{gs}		--	12.7	--	nC
Gate-Drain Charge	Q_{gd}		--	16.3	--	nC
Turn-on Delay Time	$t_{d\ (on)}$	V_{GS}=10V, V_{DS}=160V, R_L=17.7Ω,R_{GEN}=4.7Ω	--	32	--	ns
Turn-on Rise Time	t_r		--	32.1	--	ns
Turn-off Delay Time	$t_{d(off)}$		--	60.9	--	ns
Turn-off Fall Time	t_f		--	5.2	--	ns
Dynamic						
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=25V, f=1MHz	--	2610	--	pF
Output Capacitance	C_{oss}		--	68	--	pF
Reverse Transfer Capacitance	C_{rss}		--	21	--	pF

A: The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The value in any given application depends on the user's specific board design.

B: Repetitive rating, pulse width limited by junction temperature.

C: The current rating is based on the t≤ 10s junction to ambient thermal resistance rating.

D:The RθJA is the sum of the thermal impedance from junction to lead RθJA and lead to ambient.

E:The static characteristics in Figures 1 to 6 are obtained using <300us pulses,duty cycle 0.5% max.

F:These curves are based on the junction-to-ambient thermal impedance which is measured with the device mounted on 1 in2 FR-4 board with 2oz.Copper,assuming a maximum junction temperature of $T_{J(MAX)}$ =150℃.The SOA curve provides a single pulse rating.

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

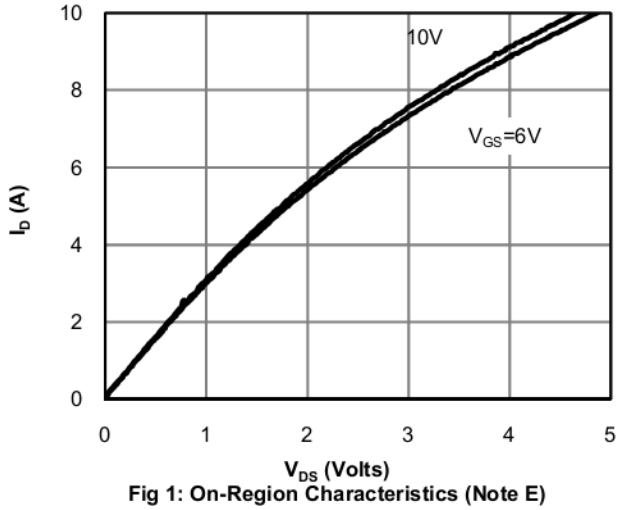


Fig 1: On-Region Characteristics (Note E)

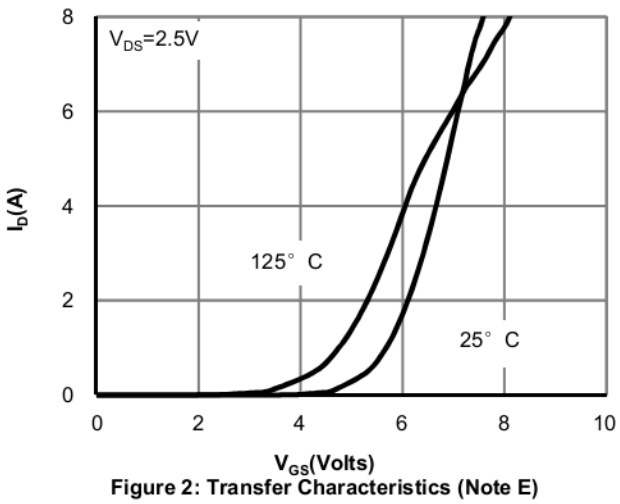


Figure 2: Transfer Characteristics (Note E)

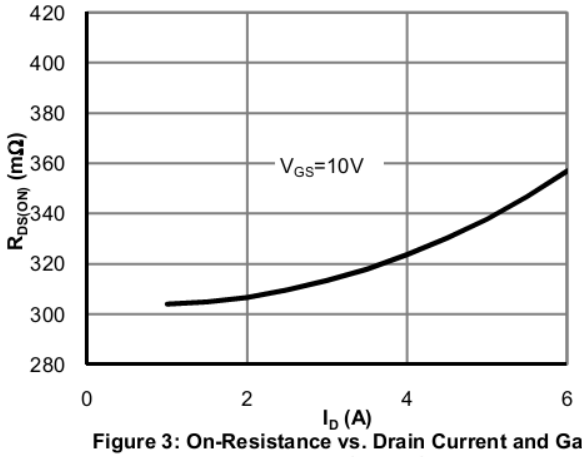


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

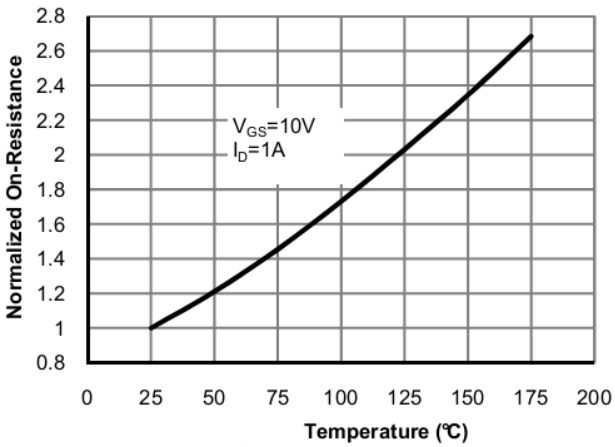


Figure 4: On-Resistance vs. Junction Temperature (Note E)

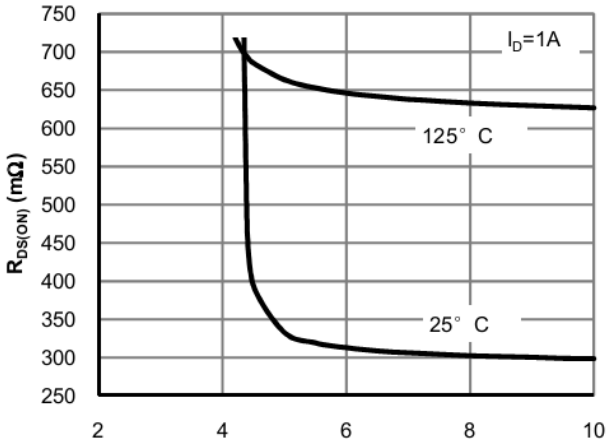


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

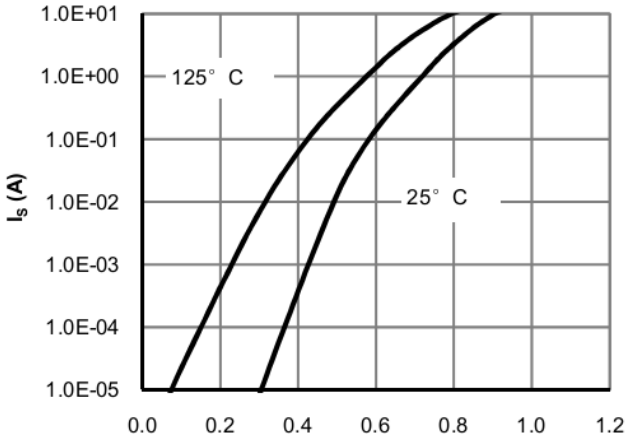


Figure 6: Body-Diode Characteristics (Note E)

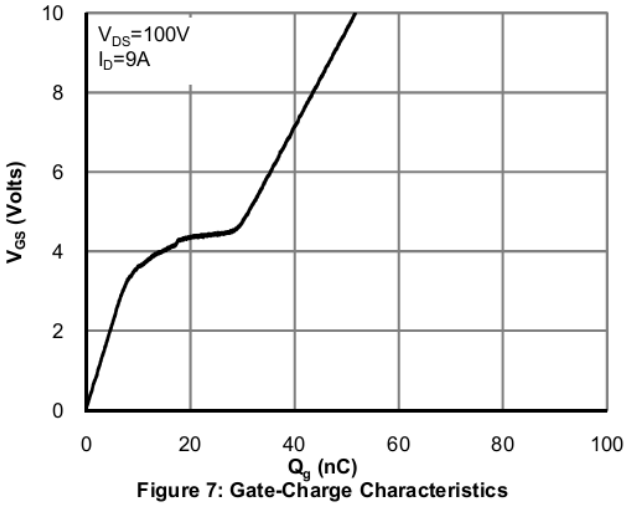


Figure 7: Gate-Charge Characteristics

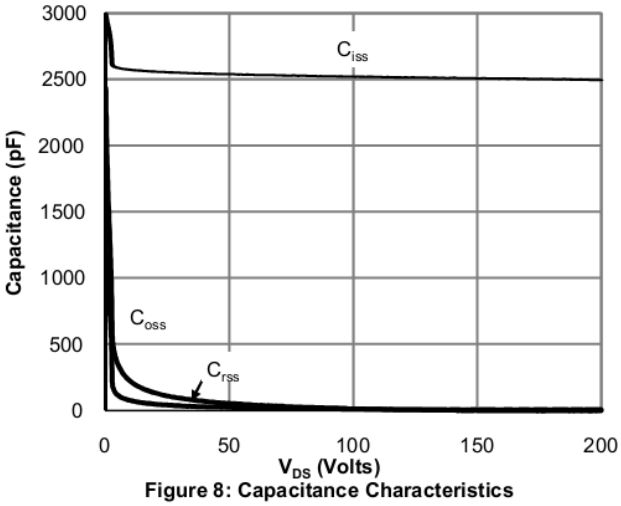


Figure 8: Capacitance Characteristics

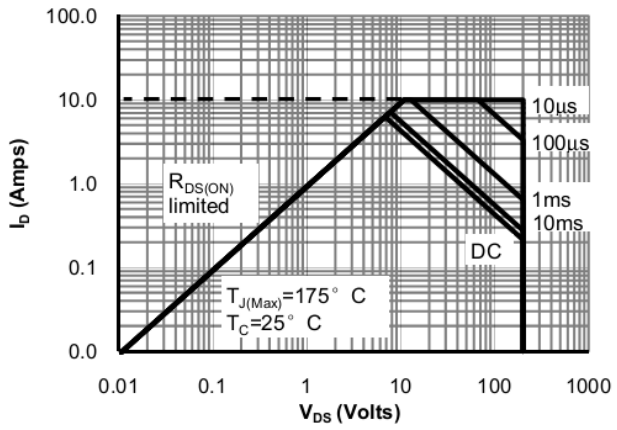


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

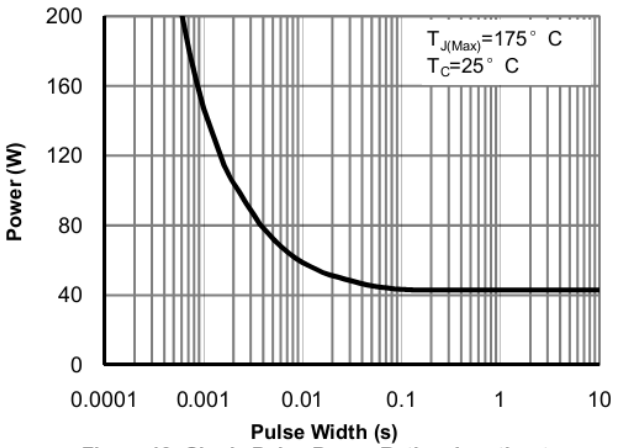


Figure 10: Single Pulse Power Rating Junction-to-Case (Note F)

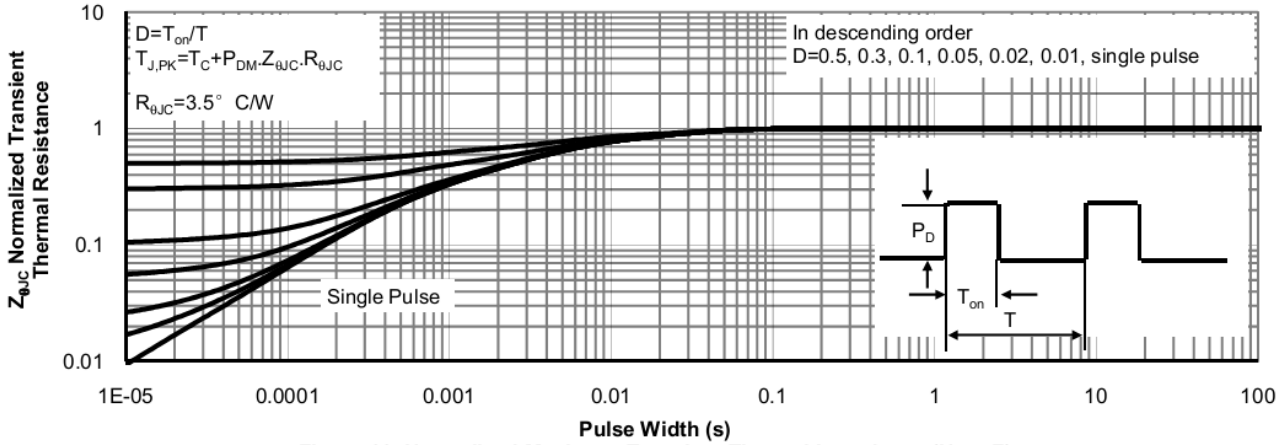


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)