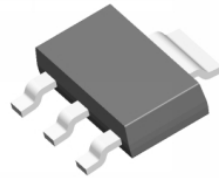


Main Product Characteristics

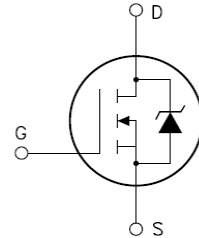
V_{DSS}	40V
$R_{DS(on)}$	43m Ω (typ.)
I_D	7A



SOT-223



Marking and Pin Assignment



Schematic Diagram

Features and Benefits

- Advanced MOSFET process technology
- Ideal for DC-DC and DC-AC converters, load switching and general purpose applications
- Ultra low on-resistance with low gate charge
- Fast switching and reverse body recovery
- 175°C operating temperature



Description

SSF4072G5 utilizes the latest techniques to achieve high cell density, low on-resistance and high repetitive avalanche rating. These features make this device extremely efficient and reliable for use in DC-DC and DC-AC converters and a wide variety of other applications.

Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Max.	Units
$I_D @ T_C = 25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10\text{V}$ ①	7	A
$I_D @ T_C = 100^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10\text{V}$ ①	5.7	
I_{DM}	Pulsed Drain Current②	28	
$P_D @ T_C = 25^\circ\text{C}$	Power Dissipation③	3.3	W
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-to-Source Voltage	± 20	V
E_{AS}	Single Pulse Avalanche Energy @ $L=0.3\text{mH}$	15	mJ
I_{AS}	Avalanche Current @ $L=0.3\text{mH}$	10	A
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 to +175	$^\circ\text{C}$

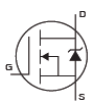
Thermal Resistance

Symbol	Characterizes	Typ.	Max.	Units
$R_{\theta JA}$	Junction-to-Ambient ($t \leq 10\text{s}$) ④	—	38	$^\circ\text{C/W}$
	Junction-to-Ambient (PCB mounted, steady-state) ④	—	35	$^\circ\text{C/W}$

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

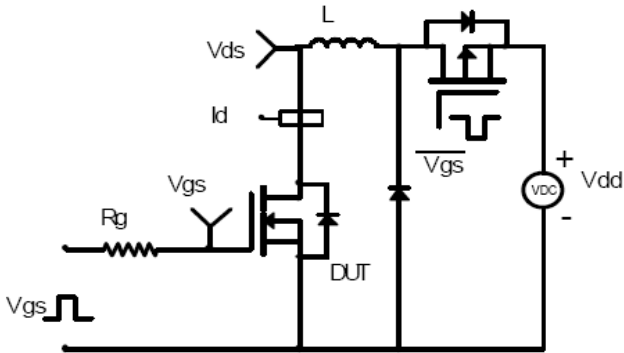
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	40	—	—	V	$V_{GS} = 0V, I_D = 250\mu A$
$R_{DS(on)}$	Static Drain-to-Source On-resistance	—	43	50	m Ω	$V_{GS}=10V, I_D = 4.0A$
		—	68	72		$V_{GS}=5V, I_D = 3.0A$
$V_{GS(th)}$	Gate Threshold Voltage	1	—	2.5	V	$V_{DS} = V_{GS}, I_D = 250\mu A$
I_{DSS}	Drain-to-Source Leakage Current	—	—	1	μA	$V_{DS} = 60V, V_{GS} = 0V$ $T_J = 125^{\circ}\text{C}$
		—	—	10		
I_{GSS}	Gate-to-Source Forward Leakage	—	—	100	nA	$V_{GS} = 20V$
		—	—	-100		$V_{GS} = -20V$
g_{fs}	Forward Transconductance	—	8	—	S	$V_{DS} = 15V, I_D = 1.5A$
Q_g	Total Gate Charge	—	12	—	nC	$I_D = 4A,$ $V_{DS}=30V,$ $V_{GS} = 10V$
Q_{gs}	Gate-to-Source Charge	—	3.5	—		
Q_{gd}	Gate-to-Drain("Miller") Charge	—	3.7	—		
$t_{d(on)}$	Turn-on Delay Time	—	9.2	—	ns	$V_{GS}=10V, V_{DS}=30V,$ $R_{GEN}=50\Omega, I_D = 2.2A,$
t_r	Rise Time	—	16.7	—		
$t_{d(off)}$	Turn-Off Delay Time	—	35.4	—		
t_f	Fall Time	—	8.6	—		
C_{iss}	Input Capacitance	—	582	—	pF	$V_{GS} = 0V$ $V_{DS} = 40V$ $f = 1\text{MHz}$
C_{oss}	Output Capacitance	—	49	—		
C_{rss}	Reverse Transfer Capacitance	—	36	—		

Source-Drain Ratings and Characteristics

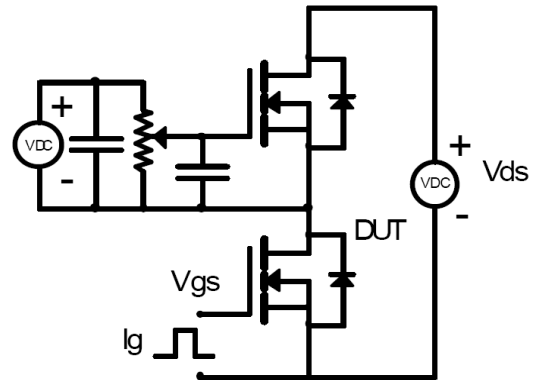
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	7	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode)	—	—	28	A	
V_{SD}	Diode Forward Voltage	—	—	1.5	V	

Test Circuits and Waveforms

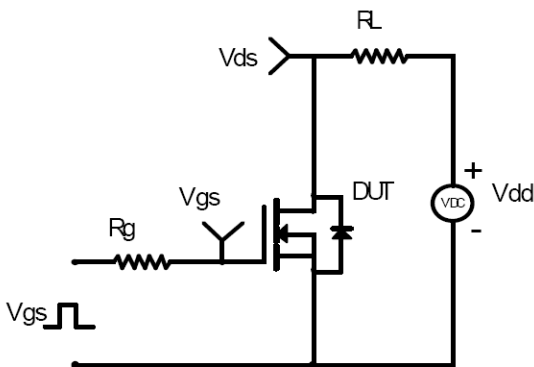
EAS Test Circuit



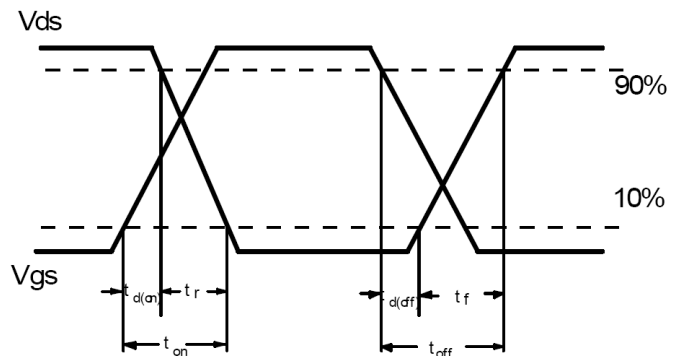
Gate charge test circuit



Switching Time Test Circuit



Switching Waveforms



Notes

- ① The maximum current rating is limited by bond-wires.
- ② Repetitive rating; pulse width limited by max. junction temperature.
- ③ The power dissipation P_D is based on max. junction temperature, using junction-to-ambient thermal resistance.
- ④ The value of $R_{\theta JA}$ is measured with the device mounted on 1in 2 FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ\text{C}$

Typical Electrical and Thermal Characteristics

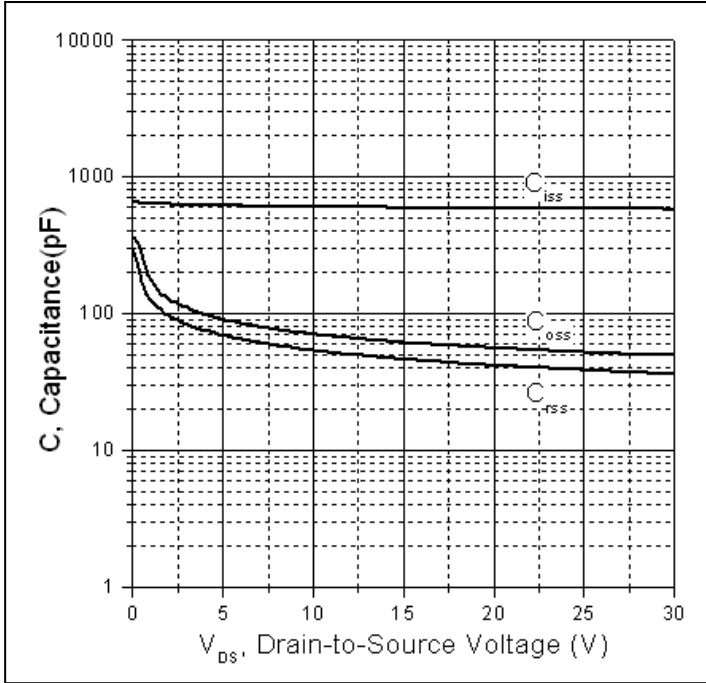


Figure 1: Typical Capacitance Vs. Drain-to-Source Voltage

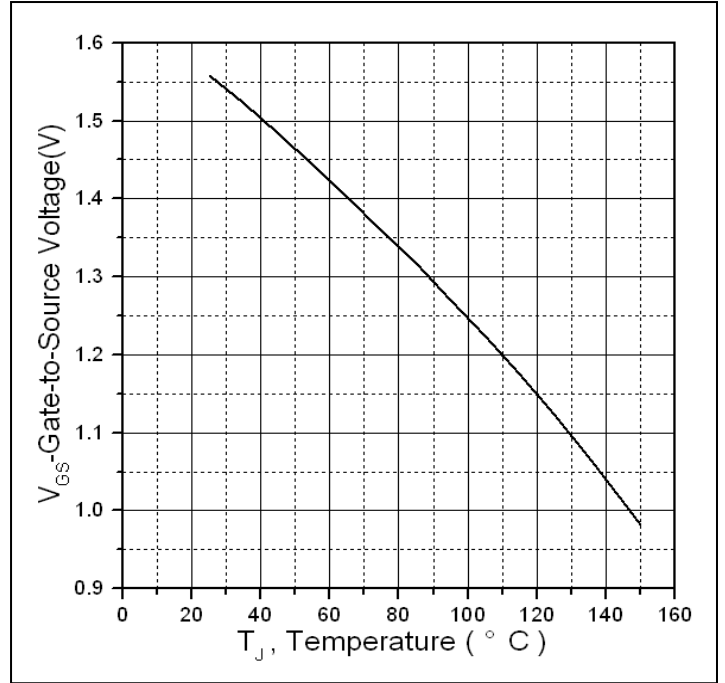


Figure 2: Gate to source cut-off voltage

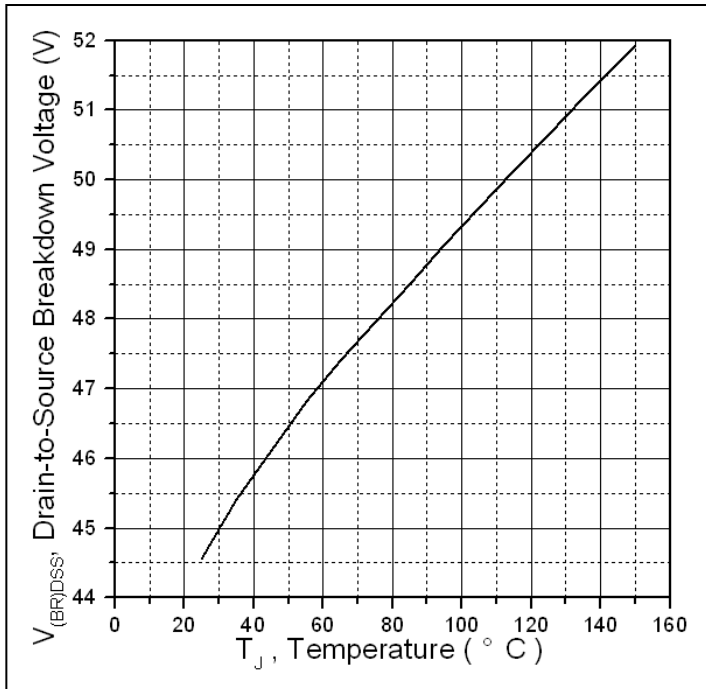


Figure 3: Drain-to-Source Breakdown Voltage Vs. Case Temperature

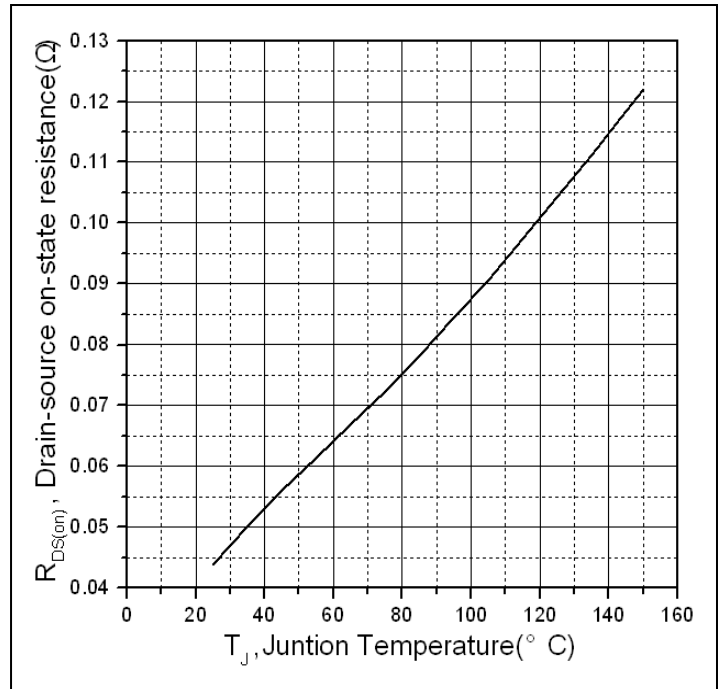


Figure 4: Normalized On-Resistance Vs. Case Temperature

Typical Electrical and Thermal Characteristics

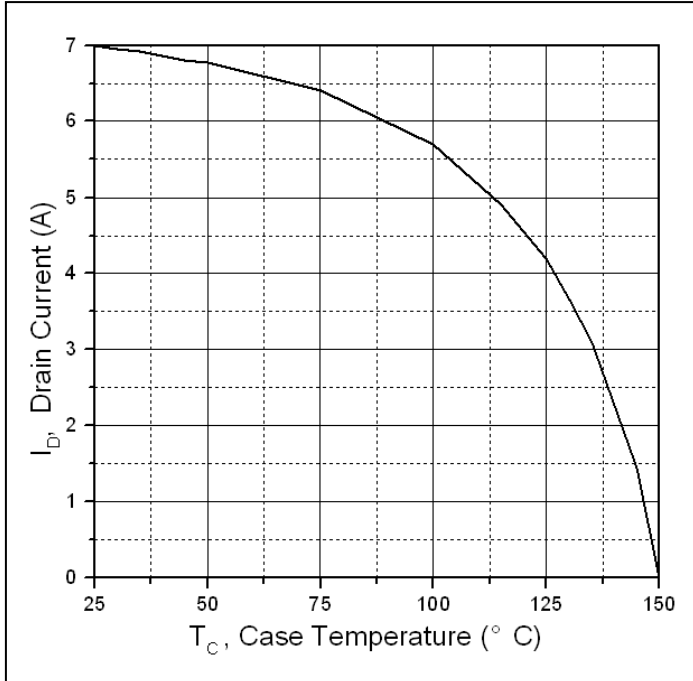


Figure 5. Maximum Drain Current Vs. Case Temperature

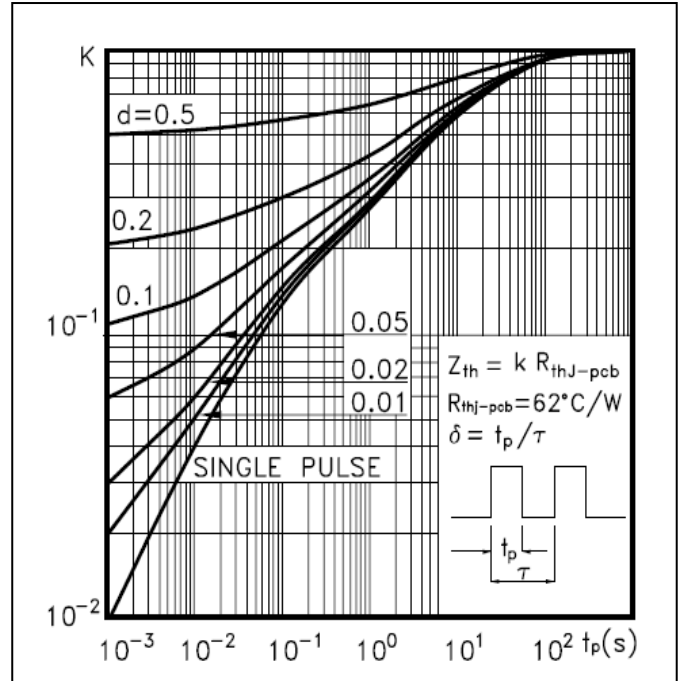
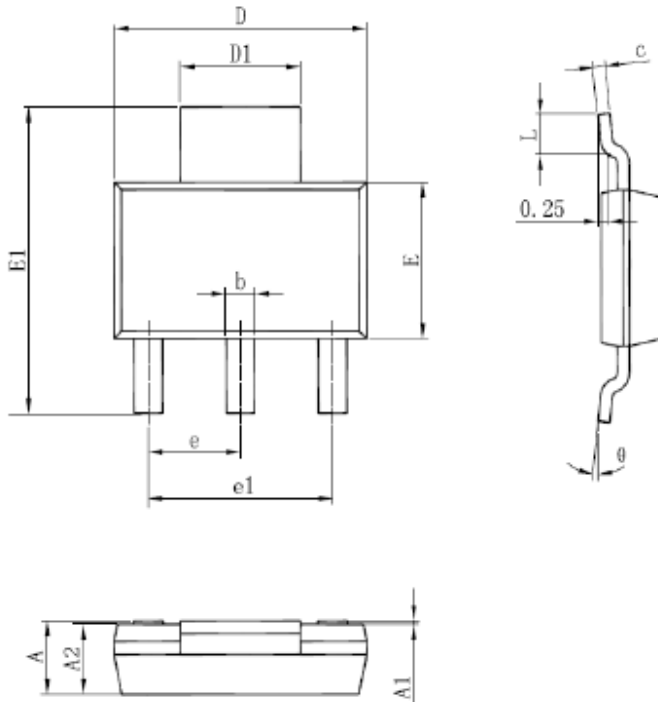


Figure 6. Maximum Effective Transient Thermal Impedance, Junction-to-Case

Mechanical Data

SOT-223

SOT-223 Dimensions in Millimeters (UNIT: mm)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.520	1.800	0.060	0.071
A1	0.000	0.100	0.000	0.004
A2	1.500	1.700	0.059	0.067
b	0.660	0.820	0.026	0.032
c	0.250	0.350	0.010	0.014
D	6.200	6.400	0.244	0.252
D1	2.900	3.100	0.114	0.122
E	3.300	3.700	0.130	0.146
E1	6.830	7.070	0.269	0.278
e	2.300(BSC)		0.091(BSC)	
e1	4.500	4.700	0.177	0.185
L	0.900	1.150	0.035	0.045
theta	0°	10°	0°	10°

Notes:

- ① Dimensions are inclusive of plating
- ② Package body sizes exclude mold flash and gate burrs. Mold flash at the non-lead sides should be less than 6 mils.
- ③ Dimension L is measured in gauge plane.
- ④ Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

Ordering and Marking Information

<p>Device Marking: SSF4072G5</p> <p style="text-align: center;">Package (Available) SOT-223</p> <p style="text-align: center;">Operating Temperature Range C : -55 to 175°C</p>
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Devices per Unit

Package Type	Units/ Tape	Tapes/ Inner Box	Units/ Inner Box	Inner Boxes/ Carton Box	Units/ Carton Box
SOT-223	2500pcs	2pcs	5000pcs	8pcs	40000pcs

Reliability Test Program

Test Item	Conditions	Duration	Sample Size
High Temperature Reverse Bias(HTRB)	$T_J = 150^\circ\text{C}$ @ 80% of Max V_{DSS}	168 hours 500 hours 1000 hours	3 lots x 77 devices
High Temperature Gate Bias(HTGB)	$T_J = 150^\circ\text{C}$ @100% of Max V_{GSS}	168 hours 500 hours 1000 hours	3 lots x 77 devices