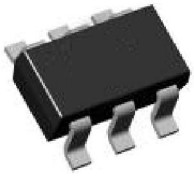
GOOD-ARK
SEMICONDUCTOR

SSF3051G7

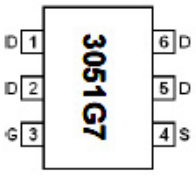
30V P-Channel MOSFET

Main Product Characteristics

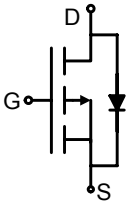
V_{DSS}	-30V
$R_{DS(ON)}$	41mΩ (typ.)
I_D	-4.4A



SOT-23-6L



Marking and Pin Assignment



Schematic Diagram

Features and Benefits

- Advanced trench MOSFET process technology
- Ideal for PWM, load switching and general purpose applications
- Ultra low on-resistance with low gate charge
- Fast switching and reverse body recovery
- 150°C operating temperature

Description

The SSF3051G7 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 supply and a wide variety of other applications.

Absolute Max Ratings (T_A=25°C unless otherwise specified)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	±25	V
Drain Current-Continuous@ Current-Pulsed (Note 1)	I_D	-4.4	A
Pulsed Drain Current (Note 2)	I_{DM}	-25	A
Maximum Power Dissipation	P_D	1.7	W
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 150	°C

Thermal Resistance

Thermal Resistance, Junction-to-Ambient (Note 1)	$R_{\theta JA}$	75	°C/W
Thermal Resistance, Junction-to-Case (Note 1)	$R_{\theta JC}$	30	°C/W

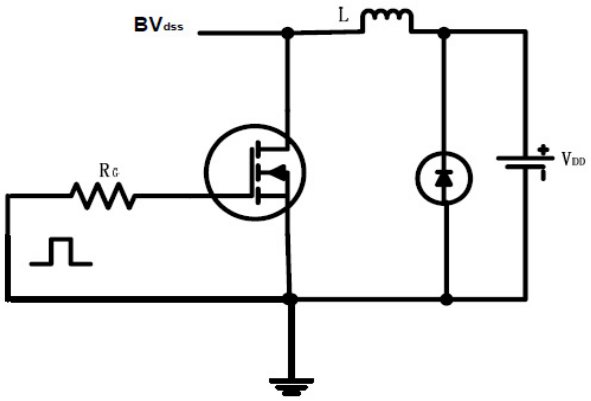
www.datasheet.live

Electrical Characteristics (T_A=25°C unless otherwise specified)

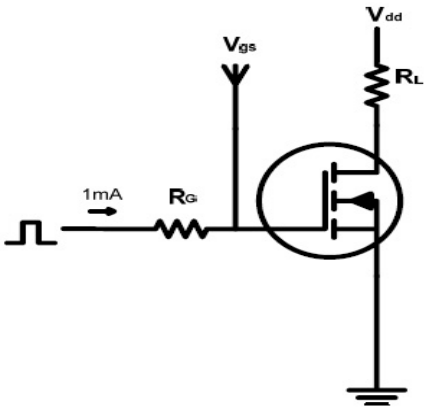
Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=-250μA	-30	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-24V,V_{GS}=0V	-	-	-1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±25V,V_{DS}=0V	-	-	±100	nA
ON CHARACTERISTICS (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=-250μA	-1	-1.6	-3	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-4.4A	-	41	48	mΩ
		V_{GS}=-4.5V, I_D=-3.4A	-	57	75	mΩ
Forward Transconductance	g_{FS}	V_{DS}=-5V,I_D=-4A	-	8.5	-	S
Gate Resistance	R_G	V_{DS}=0V, V_{GS}=0V, F=1.0MHz	-	3.3	-	Ω
DYNAMIC CHARACTERISTICS (Note4)						
Input Capacitance	C_{lss}	V_{DS}=-15V,V_{GS}=0V, F=1.0MHz	-	520	-	PF
Output Capacitance	C_{oss}		-	94	-	PF
Reverse Transfer Capacitance	C_{rss}		-	73	-	PF
SWITCHING CHARACTERISTICS (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=-15V,I_D=-1A V_{GS}=-10V,R_{GEN}=6Ω	-	8.9	-	nS
Turn-on Rise Time	t_r		-	4.0	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	22.6	-	nS
Turn-Off Fall Time	t_f		-	5.5	-	nS
Total Gate Charge	Q_g	V_{DS}=-5V,I_D=-4A, V_{GS}=-5V	-	7.1	-	nC
Gate-Source Charge	Q_{gs}		-	0.86	-	nC
Gate-Drain Charge	Q_{gd}		-	3.9	-	nC
DRAIN-SOURCE DIODE CHARACTERISTICS						
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V,I_S=-1.3A	-	-0.8	-1.2	V
Diode Forward Current (Note 2)	I_S		-	-	-4.4	A
Reverse Recovery Time	t_{rr}	Tj=25℃,IF=-4A, di/dt=-100A/uS	-	10.3	-	nS
Reverse Recovery Charge	Q_{rr}		-	4.3	-	nC

Test Circuits and Waveforms

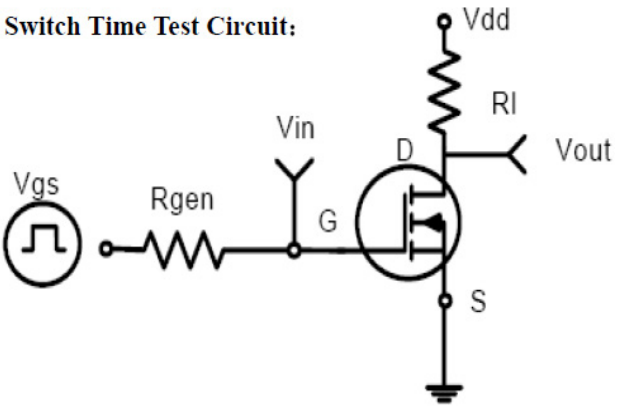
EAS test circuits:



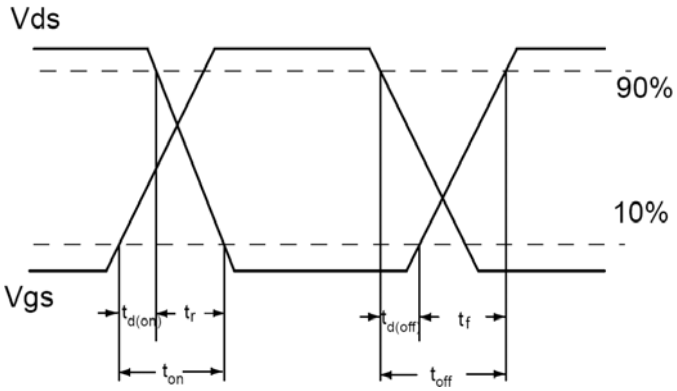
Gate charge test circuit:



Switch Time Test Circuit:



Switch Waveforms:



NOTES:

1. Device mounted on 1"x1" FR-4PC board on 0.1 inch^2 pads on 2oz copper pads and test pulse width t ≤ 10S.
2. Repetitive Rating: Pulse width limited by maximum junction temperature.
3. Pulse Test: Pulse Width ≤ 300μS, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production testing.

Typical Electrical and Thermal Characteristics

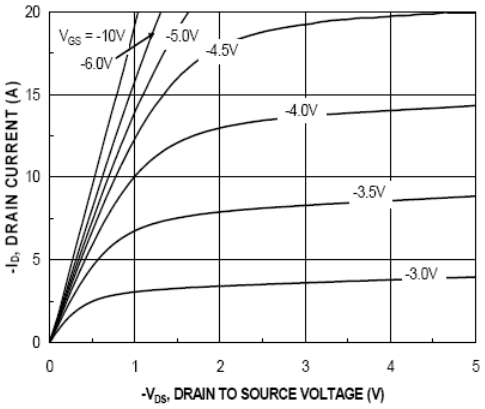


Figure 1: Typical Output Characteristics

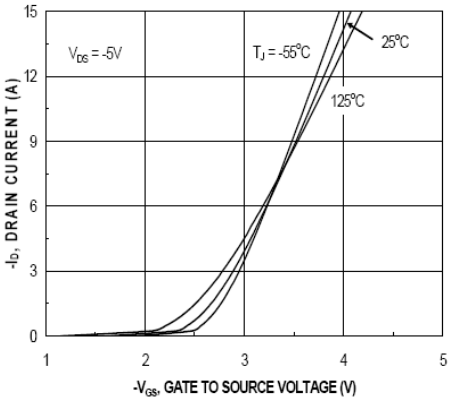


Figure 2: Transfer Characteristics

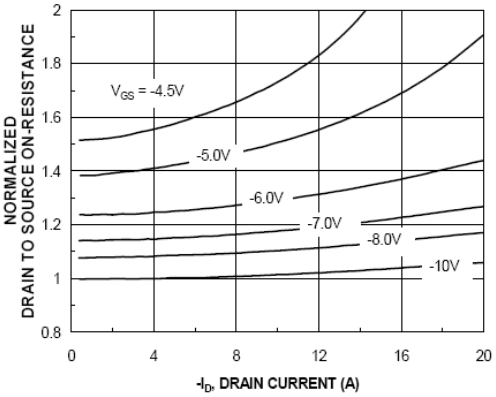


Figure 3: Drain-Source On-Resistance

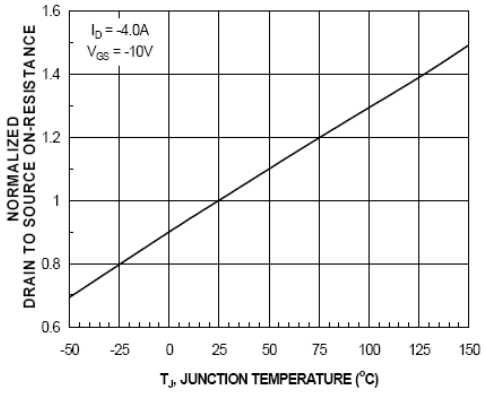


Figure 4： Drain -Source On-Resistance

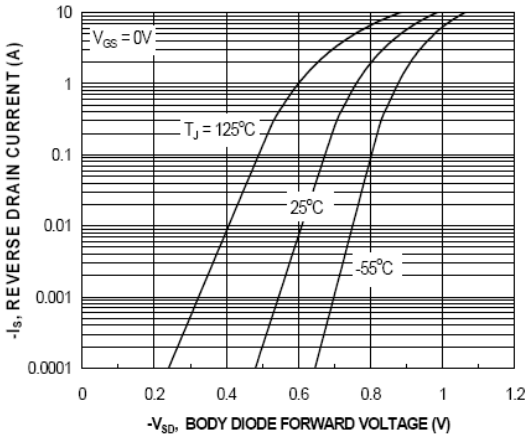


Figure 5 : Source- Drain Diode Forward

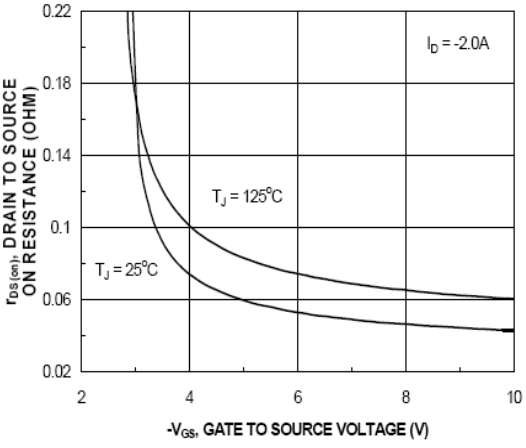


Figure 6: $R_{DS(ON)}$ vs V_{GS}

Typical Electrical and Thermal Characteristics

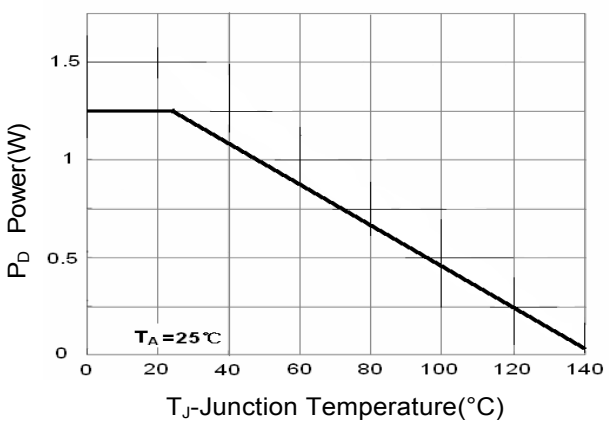


Figure 7: Power Dissipation

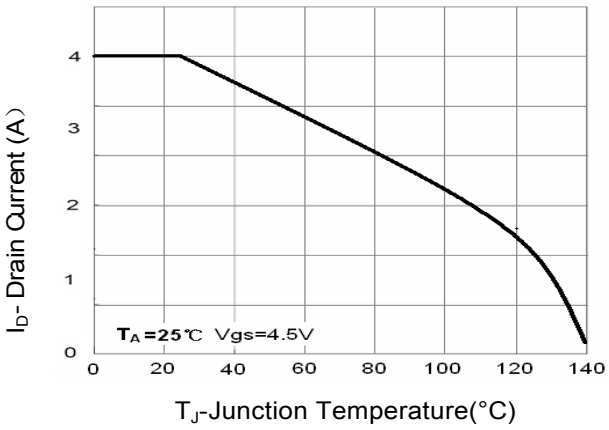


Figure 8： Drain Current

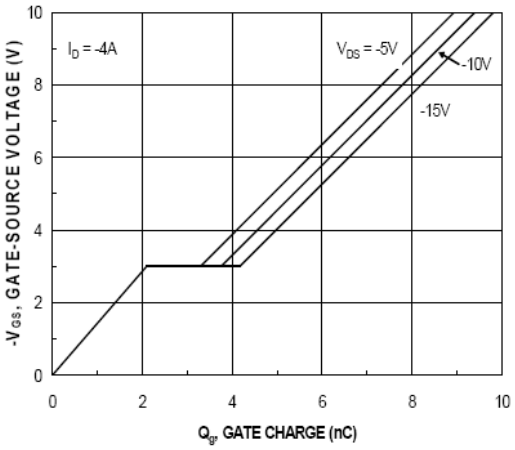


Figure 9： Ga te Charge

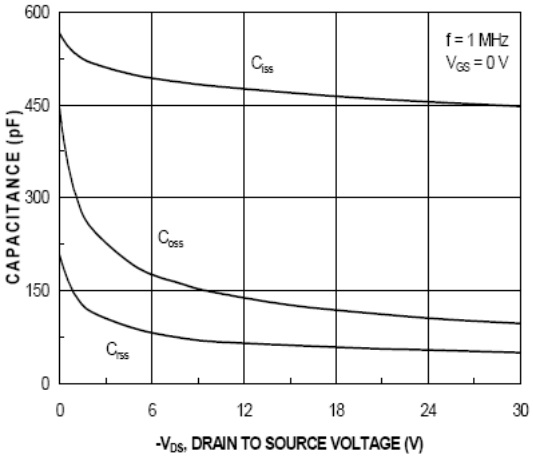


Figure 10: Capacitance vs V_{DS}

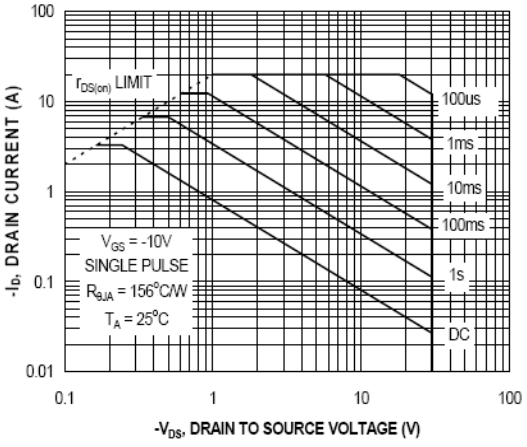


Figure 11: Safe Operation Area

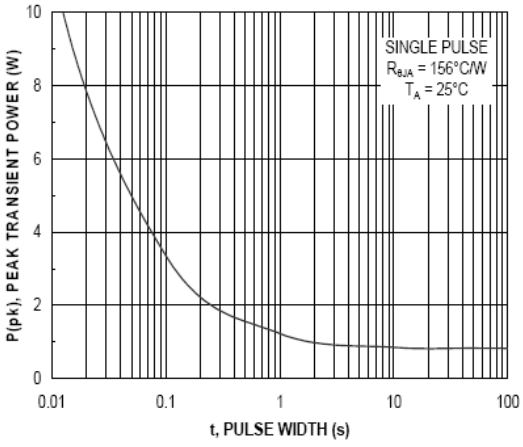


Figure 12: Single Pulse Maximum Power Dissipation

Typical Electrical and Thermal Characteristics

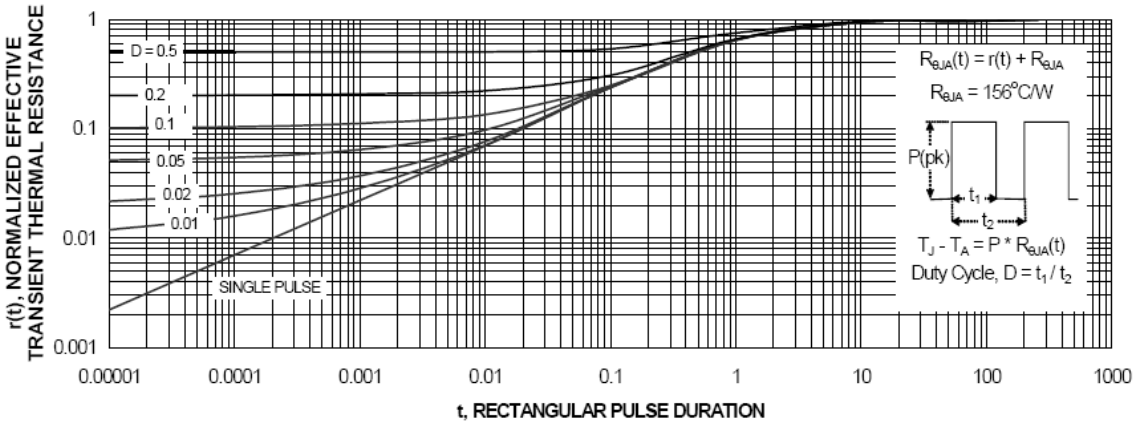
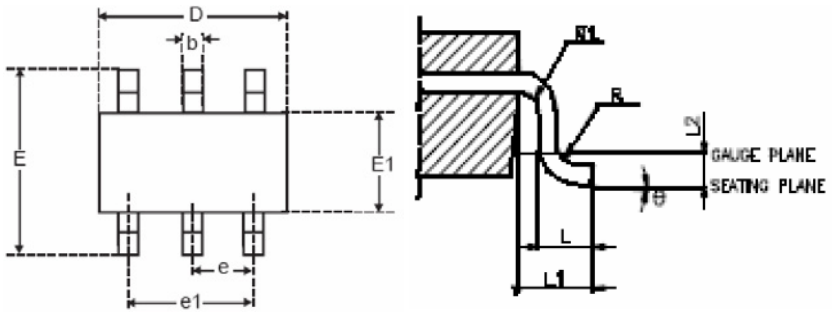
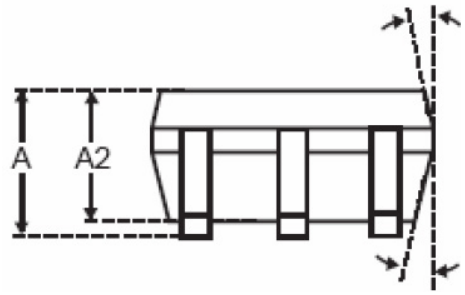


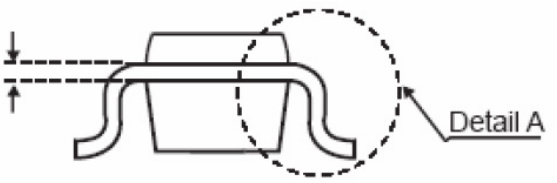
Figure 13: Normalized Maximum Transient Thermal Impedance

Mechanical Data SOT-23-6L

Dimensions in Millimeters (UNIT:mm)







SYMBOLS	MILLMETERS		
	MIN.	NOM.	MAX.
A			1.45
A1			0.15
A2	0.90	1.15	1.30
b	0.30		0.50
c	0.08		0.22
D		2.90 BSC.	
E		2.80 BSC.	
E1		1.60 BSC.	
e		0.95 BSC.	
e1		1.90 BSC.	
L	0.30	0.45	0.60
L1		0.60 REF	
L2		0.25 BSC.	
R	0.10		
R1	0.10		0.25
θ	0°	4°	8°
θ1	5°	10°	15°

NOTES:

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

Ordering and Marking Information

Device Marking: 3051G7

Package (Available)
SOT-23-6L
Operating Temperature Range
C : -55ºC to 150 ºC

Devices per Unit

Package Type	Units/ Tube	Tubes/ Inner Box	Units/ Inner Box	Inner Boxes/ Carton Box	Units/ Carton Box
SOT-23-6L	3000pcs	10pcs	30000pcs	4pcs	120000pcs

Reliability Test Program

Test Item	Conditions	Duration	Sample Size
High Temperature Reverse Bias(HTRB)	T_J=125ºC or 150ºC @ 80% of Max V_{DSS}/V_{CES}/VR	168 hours 500 hours 1000 hours	3 lots x 77 devices
High Temperature Gate Bias(HTGB)	T_J=125ºC or 150ºC @ 100% of Max V_{GSS}	168 hours 500 hours 1000 hours	3 lots x 77 devices