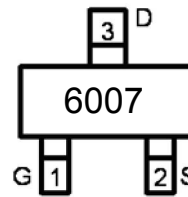


## Main Product Characteristics

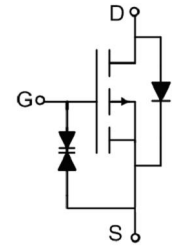
$V_{DSS}$	-50V
$R_{DS(on)}$	2.1ohm(typ.)
$I_D$	-130mA



SOT-23



Marking and Pin Assignment



Schematic Diagram

## Features and Benefits

- Advanced trench MOSFET process technology
- Special designed for Line current interrupter in telephone sets, Relay, high speed and line transformer drivers and general purpose applications
- Ultra low on-resistance with low gate charge
- Fast switching and reverse body recovery
- 150°C operating temperature
- Lead free product



## Description

It utilizes the latest trench processing techniques to achieve the high cell density and reduces the on-resistance. These features combine to make this design an extremely efficient and reliable device for use in line current interrupter in telephone sets and a wide variety of other applications

## Absolute Max Rating

Symbol	Parameter	Max.	Units
$I_D @ TC = 25^\circ C$	Continuous Drain Current, $V_{GS} @ -10V$ ①	-130	mA
$I_D @ TC = 100^\circ C$	Continuous Drain Current, $V_{GS} @ -10V$ ①	-100	
$I_{DM}$	Pulsed Drain Current②	-520	
$P_D @ TC = 25^\circ C$	Power Dissipation③	230	mW
$V_{DS}$	Drain-Source Voltage	-50	V
$V_{GS}$	Gate-to-Source Voltage	$\pm 20$	V
ESD	ESD Rating (HBM module)	1	KV
$T_J \quad T_{STG}$	Operating Junction and Storage Temperature Range	-55 to + 150	°C

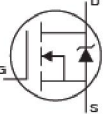
## Thermal Resistance

Symbol	Characteristics	Typ.	Max.	Units
$R_{\theta JA}$	Junction-to-ambient ( $t \leq 10s$ ) ④	—	556	°C/W
	Junction-to-Ambient (PCB mounted, steady-state) ④	—	540	°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	-50	—	—	V	$V_{GS} = 0V, I_D = -10\mu A$
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	2.1	7	$\Omega$	$V_{GS} = -10V, I_D = -130mA$
$V_{GS(th)}$	Gate threshold voltage	-0.8	—	-2	V	$V_{DS} = V_{GS}, I_D = -1mA$
$I_{DSS}$	Drain-to-Source leakage current	—	—	-0.1	$\mu A$	$V_{DS} = -40V, V_{GS} = 0V$
		—	—	-1		$V_{DS} = -50V, V_{GS} = 0V$
		—	—	-50		$T_J = 125^{\circ}\text{C}$
$I_{GSS}$	Gate-to-Source forward leakage	—	—	10	$\mu A$	$V_{GS} = 20V$
		-10	—	—		$V_{GS} = -20V$
$g_{fs}$	Forward Transconductance	50	—	—	S	$V_{DS} = -25V, I_D = -130mA$
$C_{iss}$	Input Capacitance	—	45	—	$pF$	$V_{GS} = 0;$
$C_{oss}$	Output Capacitance	—	18	—		$V_{DS} = -5V;$
$C_{rss}$	Reverse Transfer Capacitance	—	11	—		$f = 1\text{ MHz}$
$t_{d(on)}$	Turn-On Delay Time	—	3.1	—	ns	$V_{DD} = -15V;$ $I_D = -2.5A;$ $RL = 50\Omega$
$t_r$	Rise Time	—	1.3	—		
$t_{d(off)}$	Turn-Off Delay Time	—	18	—		
$t_f$	Fall Time	—	7.5	—		

### Source-Drain Ratings and Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$I_S$	Continuous Source Current (Body Diode)	—	—	130	mA	MOSFET symbol showing the integral reverse p-n junction diode. 
$I_{SM}$	Pulsed Source Current (Body Diode)	—	—	520	mA	
$V_{SD}$	Diode Forward Voltage	—	—	-1.3	V	$I_S = -130mA, V_{GS} = 0V$

### 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 PD 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  $T_A = 25^{\circ}\text{C}$

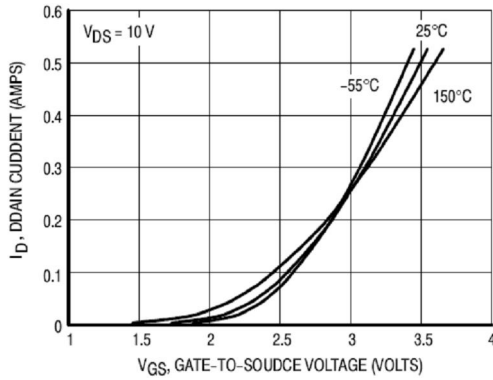


Fig 1: Transfer Characteristics

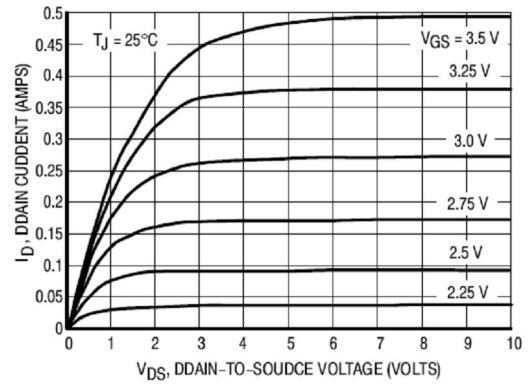


Fig 2: Out Put Curve

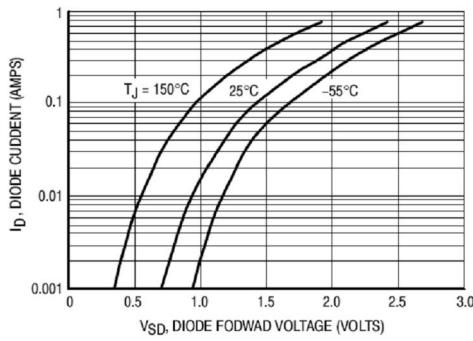


Fig 3: Body Diode Forward Curve

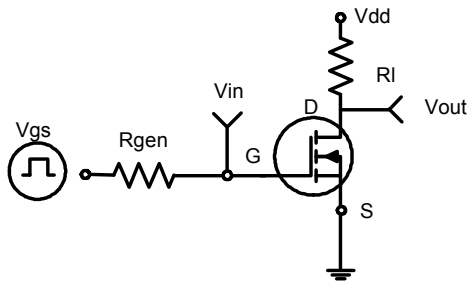


Fig 4: Switching Test Circuit

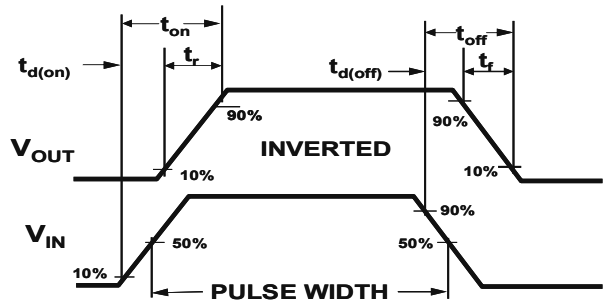
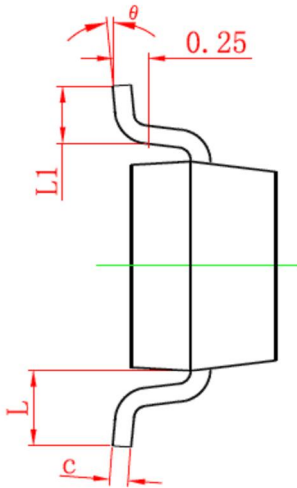
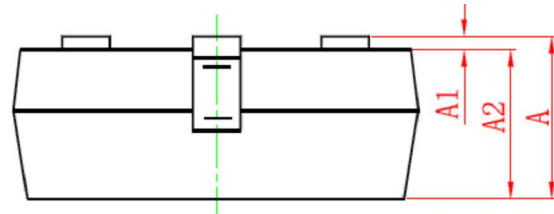
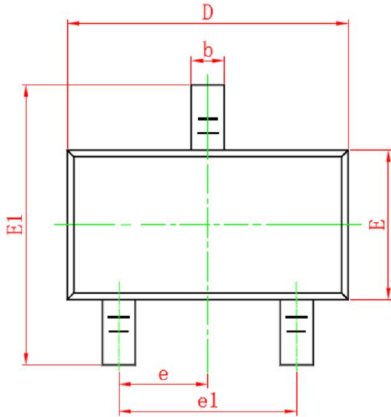


Fig 5: Switching Waveforms

**SOT-23 PACKAGE INFORMATION**

Dimensions in Millimeters (UNIT:mm)



Symbol	Dimensions in Millimeters	
	MIN.	MAX.
<b>A</b>	<b>0.900</b>	<b>1.150</b>
<b>A1</b>	<b>0.000</b>	<b>0.100</b>
<b>A2</b>	<b>0.900</b>	<b>1.050</b>
<b>b</b>	<b>0.300</b>	<b>0.500</b>
<b>c</b>	<b>0.080</b>	<b>0.150</b>
<b>D</b>	<b>2.800</b>	<b>3.000</b>
<b>E</b>	<b>1.200</b>	<b>1.400</b>
<b>E1</b>	<b>2.250</b>	<b>2.550</b>
<b>e</b>	<b>0.950TYP</b>	
<b>e1</b>	<b>1.800</b>	<b>2.000</b>
<b>L</b>	<b>0.550REF</b>	
<b>L1</b>	<b>0.300</b>	<b>0.500</b>
<b><math>\theta</math></b>	<b>0°</b>	<b>8°</b>

**NOTES**

1. All dimensions are in millimeters.
2. Tolerance  $\pm 0.10\text{mm}$  (4 mil) unless otherwise specified
3. Package body sizes exclude mold flash and gate burrs. Mold flash at the non-lead sides should be less than 5 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: 6007**

Package (Available)  
SOT-23  
Operating Temperature Range  
C : -55 to 150 °C

## Devices per Unit

Package Type	Units/ Tube	Tubes/ Inner Box	Units/ Inner Box	Inner Boxes/ Carton Box	Units/ Carton Box
SOT23	3000pcs	10pcs	30000pcs	4pcs	120000pcs

## Reliability Test Program

Test Item	Conditions	Duration	Sample Size
High Temperature Reverse Bias(HTRB)	$T_j=125^{\circ}\text{C}$ or $150^{\circ}\text{C}$ @ 80% of Max $V_{DSS}/V_{CES}/V_R$	168 hours 500 hours 1000 hours	3 lots x 77 devices
High Temperature Gate Bias(HTGB)	$T_j=125^{\circ}\text{C}$ or $150^{\circ}\text{C}$ @ 100% of Max $V_{GSS}$	168 hours 500 hours 1000 hours	3 lots x 77 devices