

# ***μHVIC<sup>TM</sup>***

## **SOT-23 High-Side Gate Driver IC**

### Features

- Floating gate driver designed for bootstrap operation
- Fully operational to +200 V
- Excellent dv/dt immunity
- Excellent negative  $V_S$  transient immunity
- Wide  $V_{CC}$  range
- UVLO on low-side and high-side
- Schmitt-trigger input with internal pull-down
- Output in phase with input
- Excellent latch immunity on all inputs & outputs
- RoHS compliant
- 6-pin SOT-23 package

### Applications

- High-side gate driver control
- Pulse transformer replacement
- General purpose switched mode power electronics

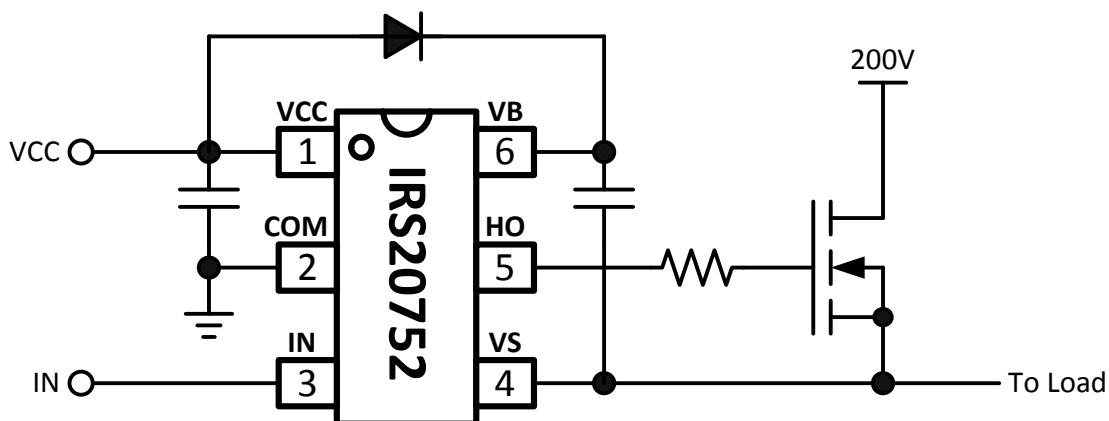
### Description

The IRS20752 is a high-side, single-channel gate driver IC with 200V blocking and level-shifting capability. This allows for the gate driver to be connected directly to the gate of a high-side power MOSFET, while being controlled by the low-side, ground potential circuitry. The IRS20752 includes a wide  $V_{CC}$  supply range, UVLO protection, and excellent immunity to harsh dv/dt or  $-V_S$  switching environments. IR's HVIC technology allows for these functions and features to be realized in a 6-pin SOT-23 package.

### Package Options



### Typical Connection Diagram



### Ordering Information

Base Part Number	Package Type	Standard Pack		Orderable Part Number
		Form	Quantity	
IRS20752LPBF	SOT-23-6L	Tape and Reel	3000	IRS20752LTPBF

<b>Table of Contents</b>	<b>Page</b>
Description	1
Ordering Information	1
Typical Connection Diagram	1
Absolute Maximum Ratings	3
Recommended Operating Conditions	3
Electrical Characteristics	4
Functional Block Diagram	5
Timing Diagram	6
Lead Definitions	7
Lead Assignments	7
Package Details: 6L-SOT23	9
Tape and Reel Details: 6L-SOT23	10
Part Marking Information	12
Qualification Information	13

## Absolute Maximum Ratings

Absolute maximum ratings indicate sustained limits beyond which damage to the device may occur. All voltage parameters are absolute voltages referenced to COM, all currents are defined positive into any pin. The thermal resistance and power dissipation ratings are measured under board mounted and still air conditions.

Symbol	Definition		Min	Max	Units
$V_B$	High side floating absolute voltage		-0.3	220	V
$V_S$	High side floating supply offset voltage		$V_B - 20$	$V_B + 0.3$	
$V_{HO}$	High side floating gate drive output voltage		$V_S - 0.3$	$V_B + 0.3$	
$V_{CC}$	Low side and logic fixed supply voltage		-0.3	20	
$V_{IN}$	Logic input voltage		COM - 0.3	$V_{CC} + 0.3$	
COM	Logic ground		$V_{CC} - 20$	$V_{CC} + 0.3$	
$dV_S/dt$	High side floating supply offset voltage slew rate		---	50	V/ns
$R\theta_{JA}$	Thermal resistance, junction to ambient	6L-SOT-23	---	151	°C/W
$T_J$	Junction temperature		-55	150	°C
$T_S$	Storage temperature				
$T_L$	IC Pin temperature (soldering, 10 seconds)				

## Recommended Operating Conditions

For proper operation the device should be used within the recommended conditions.

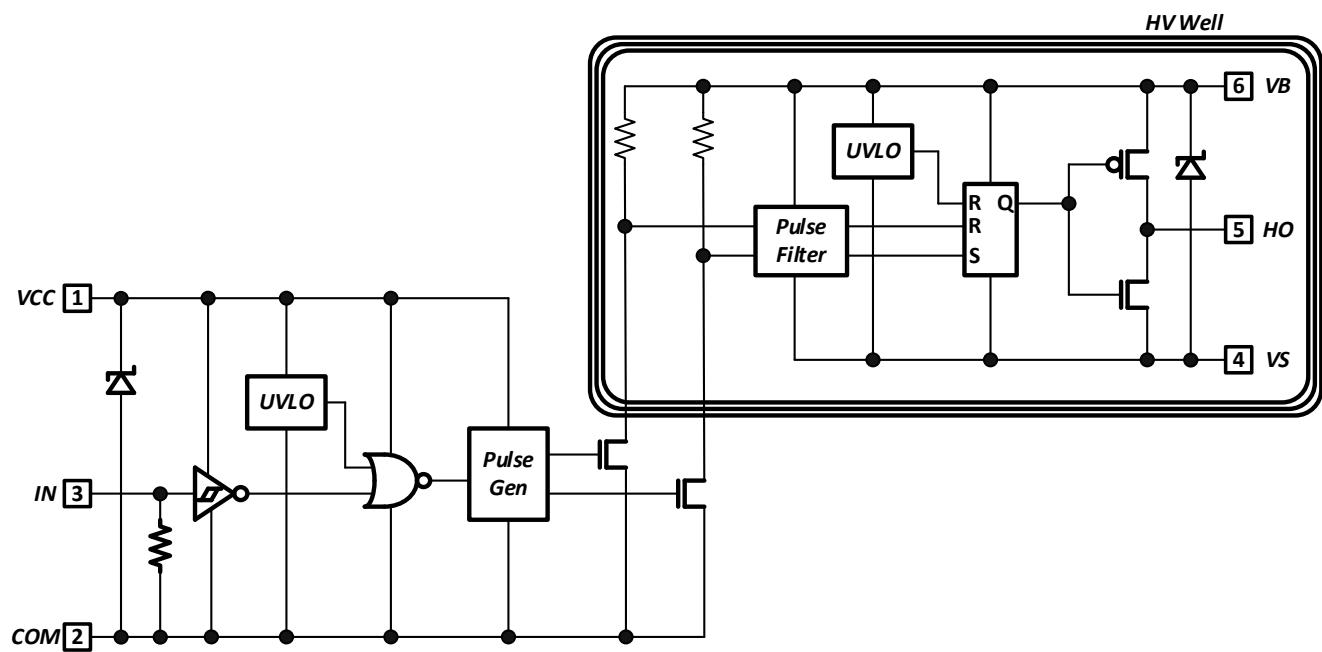
Symbol	Definition	Min	Max	Units
$V_B$	High side floating absolute voltage	$V_S + 10$	$V_S + 18$	V
$V_S$	High side floating supply offset voltage	COM - 8 <sup>†</sup>	200	
$V_{HO}$	High side floating gate drive output voltage	$V_S$	$V_B$	
$V_{CC}$	Low side and logic fixed supply voltage	10	18	
$V_{IN}$	Logic input voltage	COM	$V_{CC}$	
$T_J$	Junction temperature	-40	125	°C

<sup>†</sup> Logic operational for  $V_S$  of -8V to +200V. Logic state held for  $V_S$  of -8V to  $-V_{BS}$ .

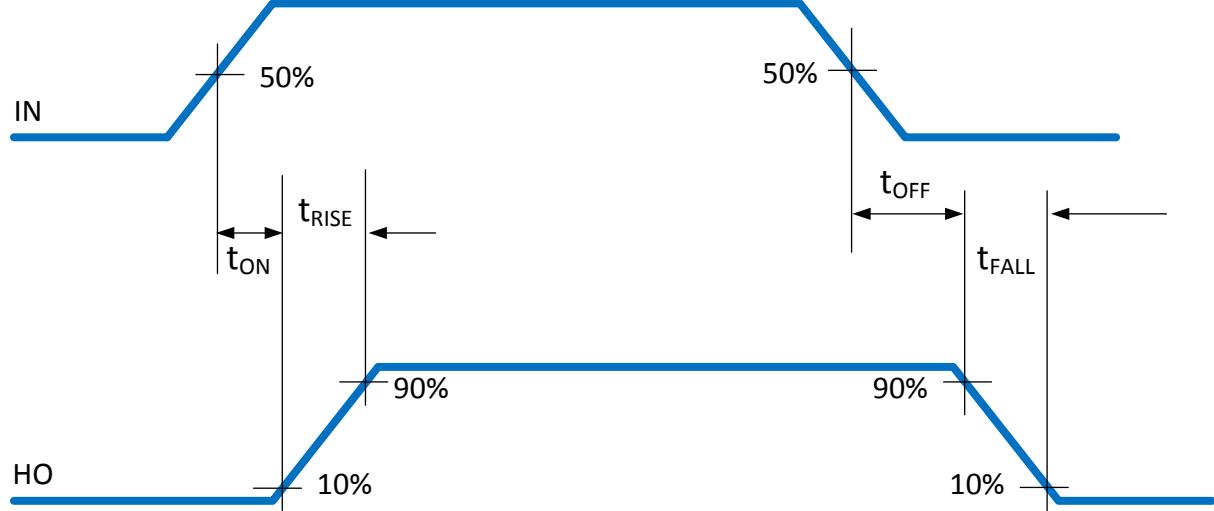
## Electrical Characteristics

$V_{CC}=15V$ ,  $V_{BS}=15V$ ,  $C_L=1000pF$ , and  $T_A = 25^{\circ}C$  unless otherwise specified.

Symbol	Definition	Min	Typ	Max	Units	Test Conditions	
<b>Low Side Characteristics</b>							
$V_{CCUV+}$	$V_{CC}$ supply UVLO positive-going	8.0	9.0	10.0	V		
$V_{CCUV-}$	$V_{CC}$ supply UVLO negative-going	7.0	8.0	9.0			
$I_{QCC}$	Quiescent $V_{CC}$ supply current	---	100	---	$\mu A$		
$V_{CC\_CLAMP}$	$V_{CC}$ internal Zener clamp voltage	---	20.4	---	V	$I_{CC} = 5mA$	
$V_{IH}$	Logic "1" input voltage	---	---	2.2	V		
$V_{IL}$	Logic "0" input voltage	0.8	---	---			
$I_{IN+}$	Logic "1" input bias current	---	20	40	$\mu A$	$V_{IN} = V_{CC}$	
$I_{IN-}$	Logic "0" input bias current	---	---	5		$V_{IN} = COM$	
<b>High Side Characteristics</b>							
$V_{BSUV+}$	$V_{BS}$ supply UVLO positive-going	8.0	9.0	10.0	V		
$V_{BSUV-}$	$V_{BS}$ supply UVLO negative-going	7.0	8.0	9.0			
$V_{BS\_CLAMP}$	$V_{BS}$ internal Zener clamp voltage	---	20.4	---	V	$I_{BS} = 5mA$	
$V_{OH}$	High level output voltage ( $V_B - HO$ )	---	0.8	1.4			
$V_{OL}$	Low level output voltage ( $HO - V_S$ )	---	0.3	0.6		$I_O = 2mA$	
$I_{LK}$	Offset supply leakage current	---	---	50	$\mu A$	$V_B = V_S = 200V$	
$I_{QBS}$	Quiescent $V_{BS}$ supply current	---	80	---		$V_{IN} = V_{CC}$ or COM	
<b>Gate Drive Characteristics</b>							
$t_{ON}$	Turn-on propagation delay	---	140	---	ns	$V_S = 0V$	
$t_{OFF}$	Turn-off propagation delay	---	215	---			$V_S = 200V$
$t_{RISE}$	Turn-on rise time	---	85	---			$V_S = 0V$
$t_{FALL}$	Turn-off fall time	---	40	---	mA		
$I_{O+}$	HO gate drive output source current	---	160	---			
$I_{O-}$	HO gate drive output sink current	---	240	---			

**Functional Block Diagram**


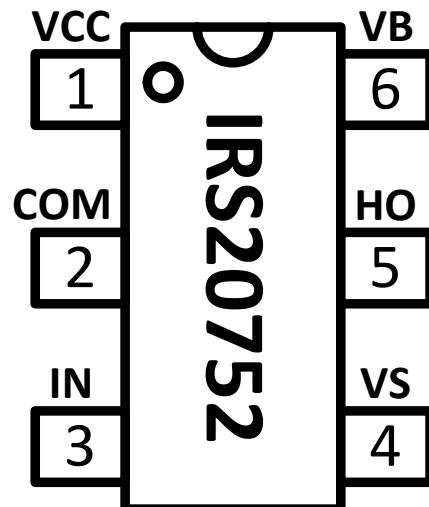
## Timing Diagram



## Pin Definitions

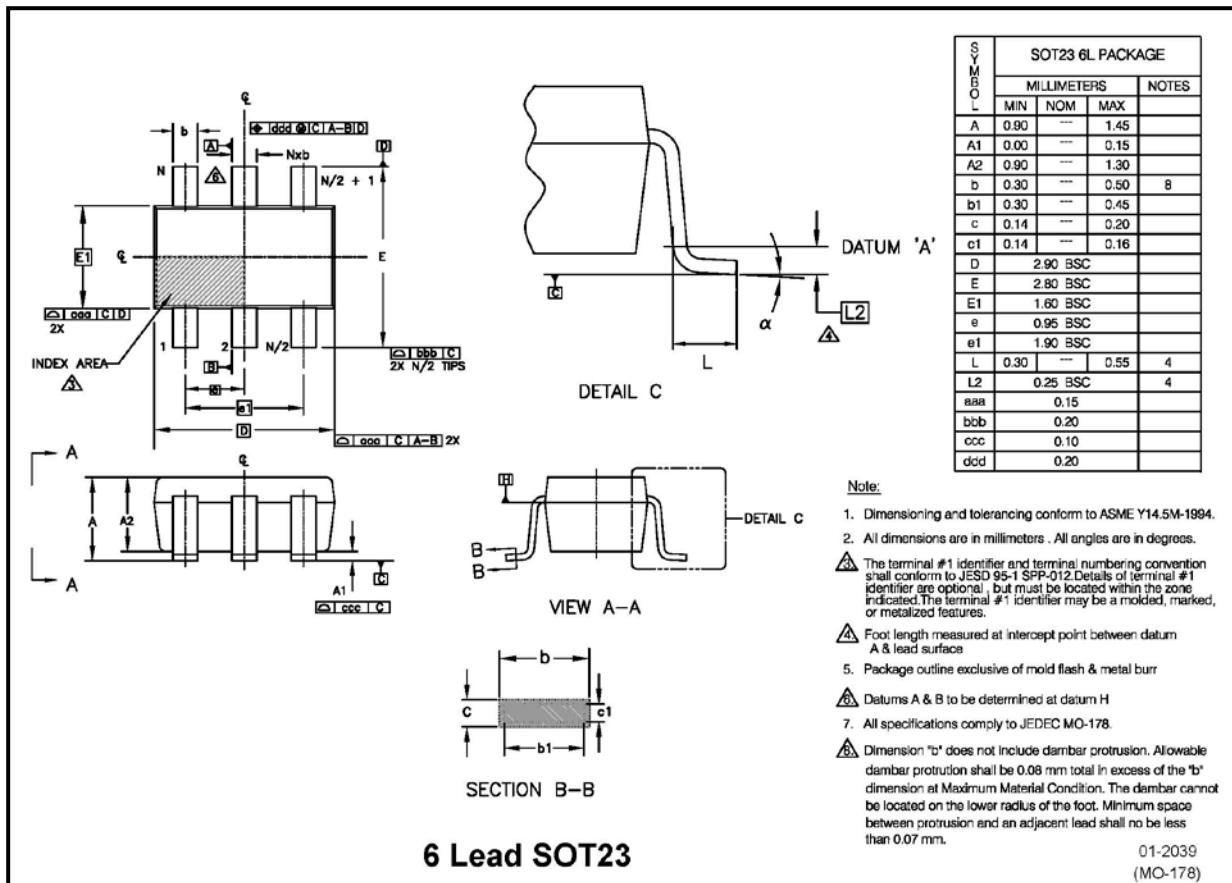
Pin	Symbol	Description
1	<b>VCC</b>	IC supply voltage
2	<b>COM</b>	IC power and signal ground
3	<b>IN</b>	Logic input
4	<b>VS</b>	High side floating supply offset voltage
5	<b>HO</b>	High side gate driver output
6	<b>VB</b>	High side floating supply voltage

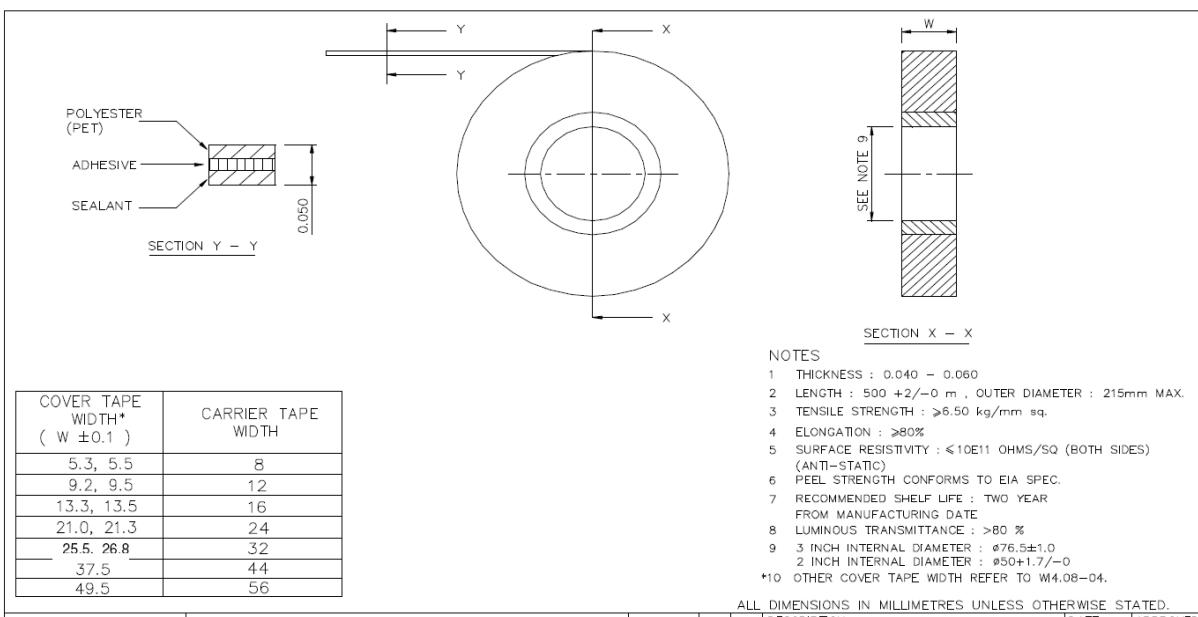
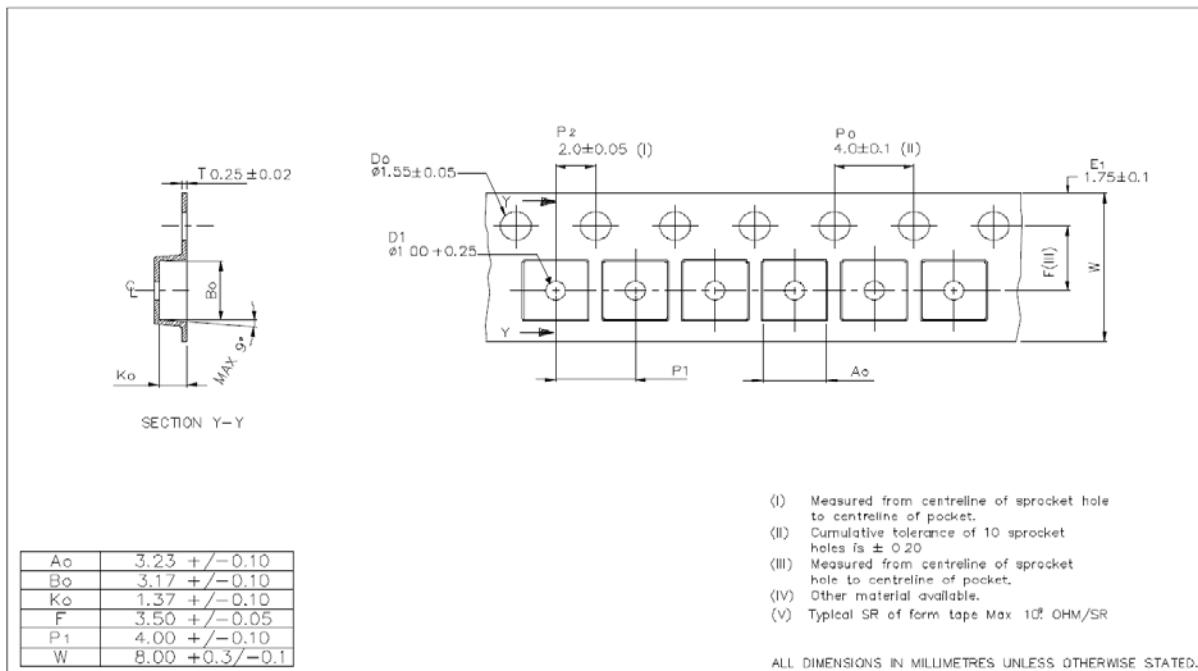
## Pin Assignments



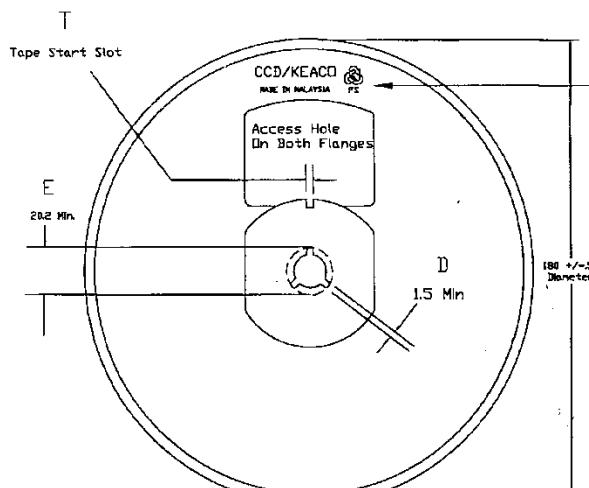
6-Lead SOT 23

## Package Details: 6L-SOT23

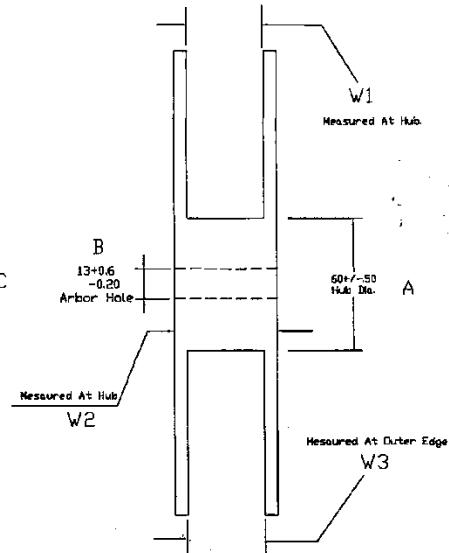


**Tape and Reel Details: 6L-SOT23**


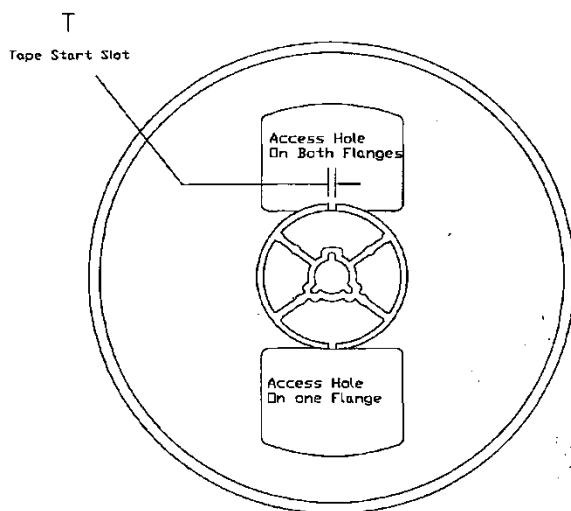
## Tape and Reel Details: 6L-SOT23



FRONT VIEW

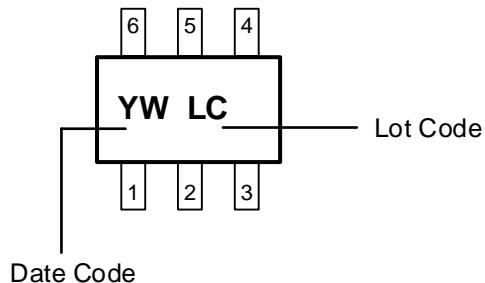
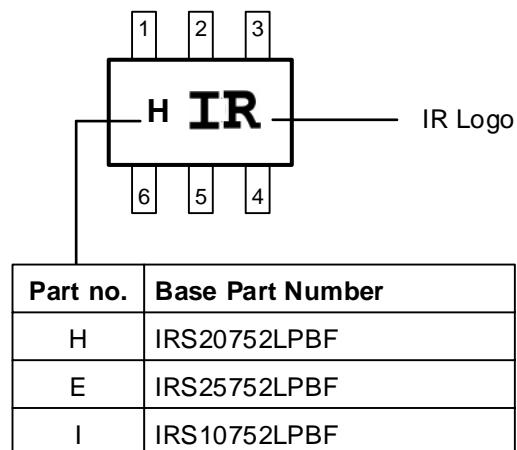


SIDE VIEW



BACK VIEW

NOTE:  
 1. MATERIAL : POLYSTRENE  
 2. SURFACE RESISTIVITY :  $\leq 10^{11}$  OHMS/SQ  
 (EXTERNAL IR DIPPED)  
 3. STATIC DECAY : < 2SEC. AT 50%RH

**Part Marking Information: 6 Lead SOT23****Top Marking****Bottom Marking**

**Qualification Information<sup>†</sup>**

<b>Qualification Level</b>		Industrial <sup>††</sup> (per JEDEC JESD 47E)	
		Comments: This family of ICs has passed JEDEC's Industrial qualification. IR's Consumer qualification level is granted by extension of the higher Industrial level.	
<b>Moisture Sensitivity Level</b>		SOT-23	MSL1 <sup>†††</sup> (per IPC/JEDEC J-STD-020C)
<b>ESD</b>	Machine Model	Class B (per JEDEC standard EIA/JESD22-A115-A)	
	Human Body Model	Class 1B (per EIA/JEDEC standard JESD22-A114-B)	
<b>IC Latch-Up Test</b>		Class I, Level A (per JESD78A)	
<b>RoHS Compliant</b>		Yes	

<sup>†</sup> Qualification standards can be found at International Rectifier's web site <http://www.infineon.com/>

<sup>††</sup> Higher qualification ratings may be available should the user have such requirements. Please contact your International Rectifier sales representative for further information.

<sup>†††</sup> Higher MSL ratings may be available for the specific package types listed here. Please contact your International Rectifier sales representative for further information.

**Revision History**

Date	Comment
01/04/2017	<ul style="list-style-type: none"> <li>• Updated "Infineon" logo –all pages.</li> <li>• Added disclaimer on last page.</li> <li>• Updated part marking information on page 11.</li> </ul>

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