



**THE DATASHEET OF  
PJS6631\_S2\_00001**





# PJS6631

## 20V P- MOSFET Load Switch with Level Shift & Adjustable Slew Rate

**Voltage**

**20 V**

**Current**

**2.0A**

### Features

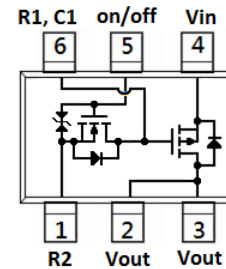
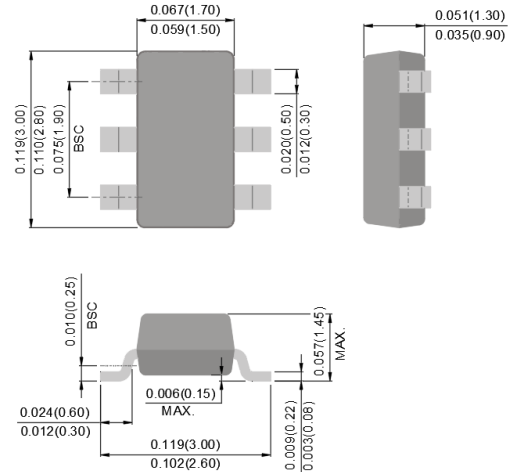
- $V_{drop} = 0.2V @ V_{in}=12V, I_L=2.0A, R_{DS(ON)}= 100m\Omega$
- $V_{drop} = 0.2V @ V_{in}=5.0V, I_L=1.8A, R_{DS(ON)}= 110m\Omega$
- $V_{drop} = 0.2V @ V_{in}=2.5V, I_L=1.4A, R_{DS(ON)}= 140m\Omega$
- Advanced Trench Process Technology
- Adjustable Turn on/off Slew Rate Control through external R1, R2 and C1
- Lead free in compliance with EU RoHS 2.0
- Green molding compound as per IEC 61249 standard

### Mechanical Data

- Case: SOT-23 6L Package
- Terminals: Solderable per MIL-STD-750, Method 2026
- Approx. Weight: 0.0005 ounces, 0.014 grams
- Marking: SL1

SOT-23 6L

Unit : inch(mm)



### Maximum Ratings and Thermal Characteristics ( $T_A=25^{\circ}C$ unless otherwise noted)

PARAMETER	SYMBOL	Ratings	UNITS
Input Voltage Range <sup>(Note 1)</sup>	$V_{IN}$	20	V
On/Off Voltage Range	$V_{ON}/V_{OFF}$	12	V
Continuous Load Current $t$ <sup>(Note 2,3)</sup>	$I_D$	2	A
Pulsed Load Current <sup>(Note 4)</sup>	$I_D$	8	A
Power Dissipation <sup>(Note 2)</sup>	$P_D$	0.83	W
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55~150	$^{\circ}C$
ESD, MIL-STD-883D HBM (100pF/1.5kohm) ( $V_{on/off}$ pin)	$V_{ESD}$	2	kV
Typical Junction to Ambient <sup>(Note 2)</sup>	$R_{\theta JA}$	150	$^{\circ}C/W$



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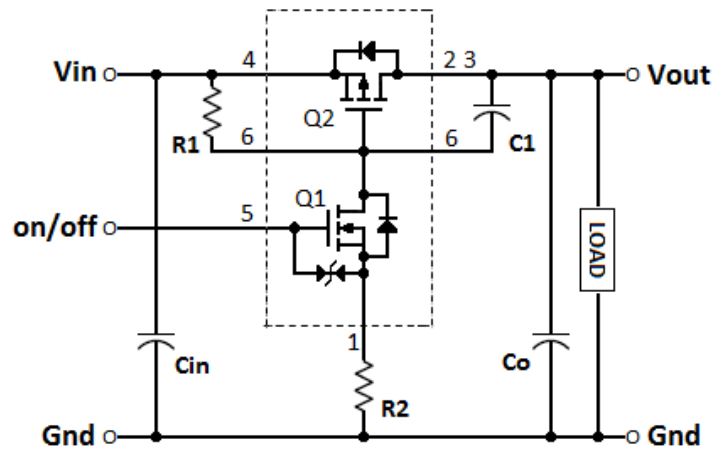
## Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNITS
<b>Off Characteristics</b>						
Leakage Current	I <sub>FL</sub>	V <sub>IN</sub> =20V, V <sub>ON</sub> /V <sub>OFF</sub> =0V	-	-	1	uA
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =-1.0A	-	-0.76	-1.2	V
<b>On Characteristics</b>						
Input Voltage Range	V <sub>IN</sub>		2.5	-	20	V
On/Off Voltage Range	V <sub>ON</sub> /V <sub>OFF</sub>		2.5	-	12	V
Drain-Source On-State Resistance (Q2)	R <sub>DS(on)</sub>	V <sub>GS</sub> =-12V, I <sub>D</sub> =-2.0A	-	84	100	mΩ
		V <sub>GS</sub> =-5.0V, I <sub>D</sub> =-1.8A	-	90	110	
		V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-1.4A	-	110	140	

**NOTES :**

1. V<sub>IN</sub> Range can be up to 20V, but R1 and R2 must be scaled such that V<sub>GS</sub> do not exceed 12V.
2. R<sub>ΘJA</sub> is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins mounted on a 1 inch FR-4 with 2oz. square pad of copper
3. The maximum current rating is package limited
4. Pulse test: pulse width ≤ 300uS, duty cycle ≤ 2%

## Application Circuits



Component Table		
R1	Pull-Up Resistor	Typical 10kΩ to 1MΩ
R2	Optional Slew-Rate Control	Typical 0kΩ to 100kΩ
C1	Optional Slew-Rate Control	Typical 1uF
<b>Note:</b> R1 should be at least 10 * R2 to ensure Q1 turn-on		



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## TYPICAL CHARACTERISTIC CURVES

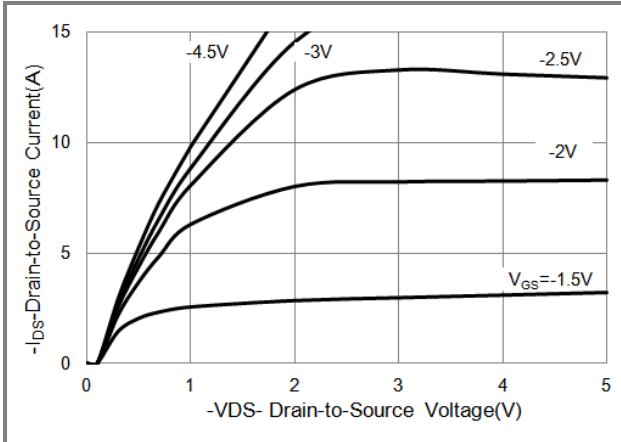


Fig.1 Output Characteristics

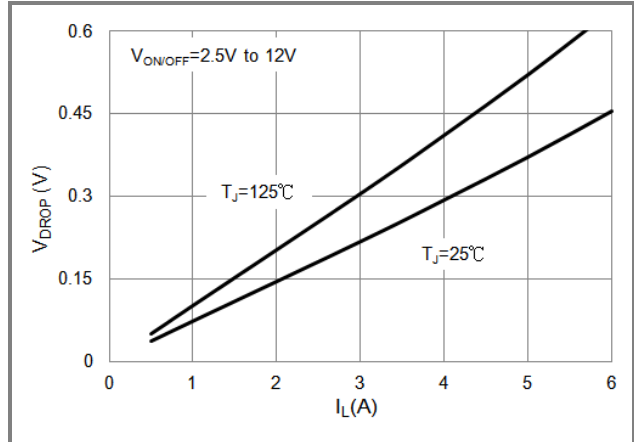


Fig.2 Vdrop vs Load Current at  $V_{in} = 12V$

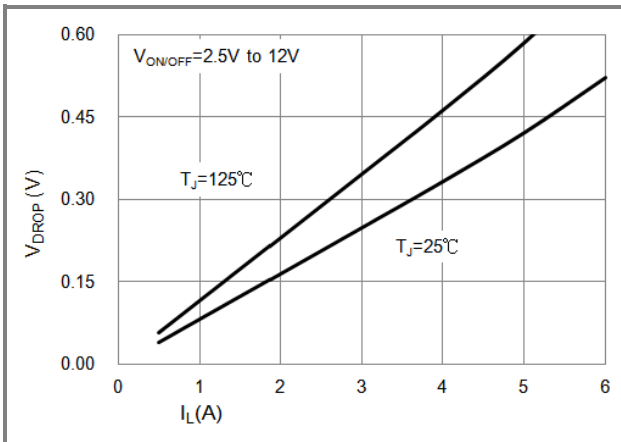


Fig.3 Vdrop vs Load Current at  $V_{in} = 4.5V$

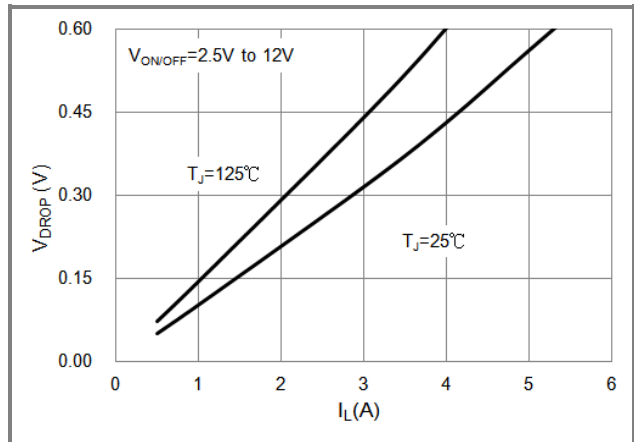


Fig.4 Vdrop vs Load Current at  $V_{in} = 2.5V$

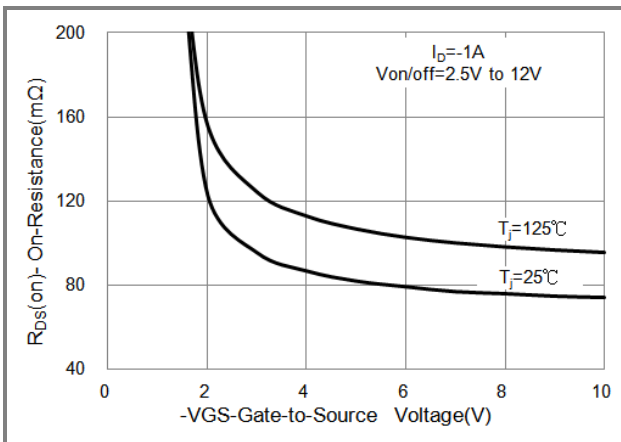


Fig.5 On-Resistance Variation with VGS.

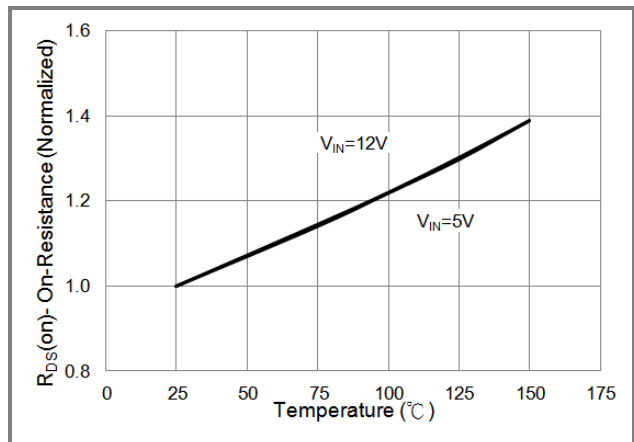


Fig.6 Normalized  $R_{DS(on)}$  vs Junction Temperature



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## TYPICAL CHARACTERISTIC CURVES

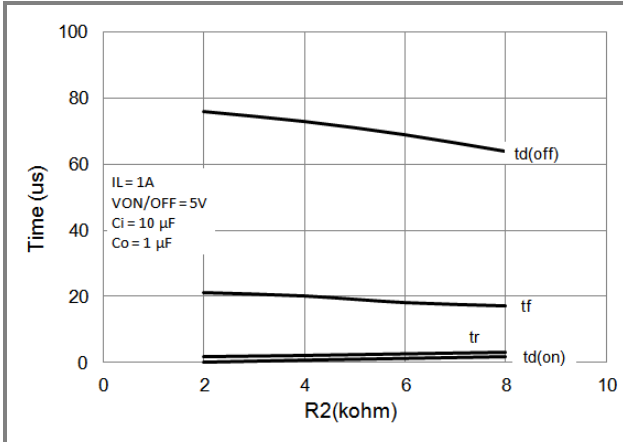


Fig.7 Switching Variation R2 at Vin=12V, R1=20k

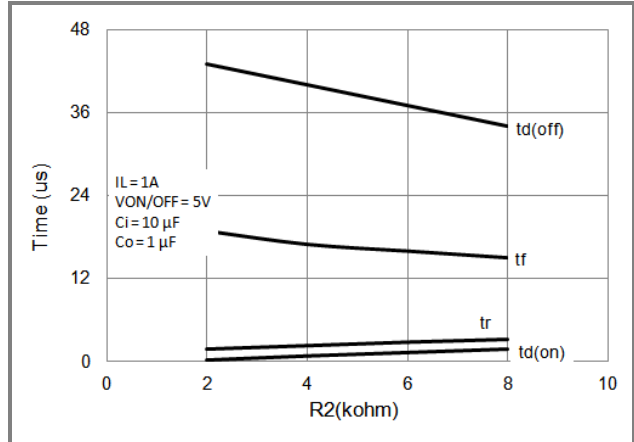


Fig.8 Switching Variation R2 at Vin= 5V, R1= 20k

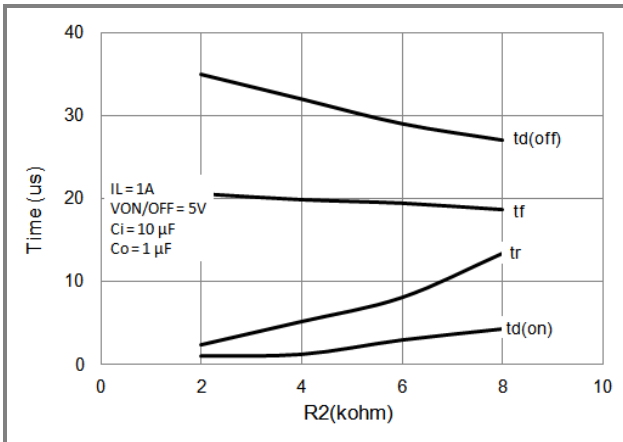


Fig.9 Switching Variation R2 at Vin=3.3V, R1=20k

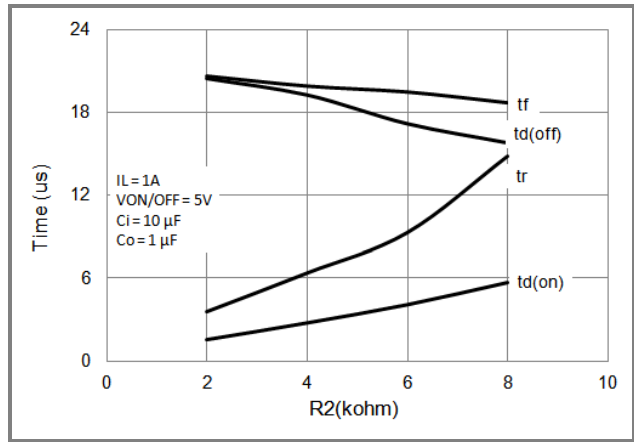


Fig.10 Switching Variation R2 at Vin=2.5V, R1=20k

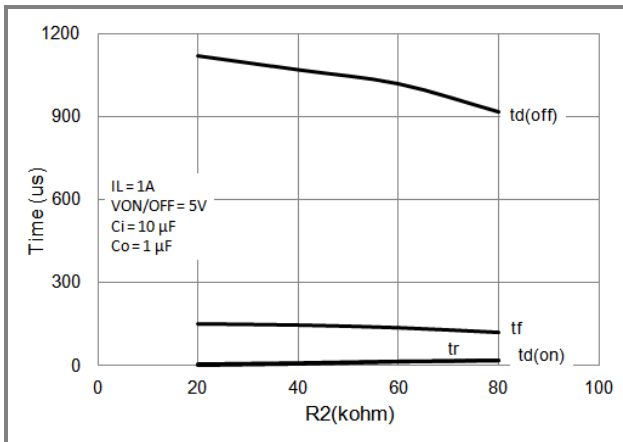


Fig.11 Switching Variation R2 at Vin=12V, R1=300k

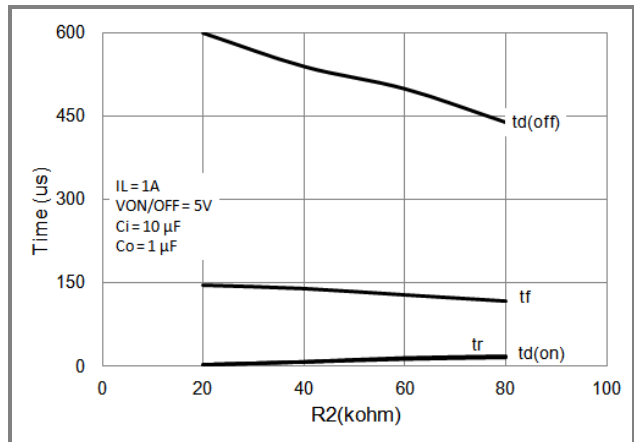


Fig.12 Switching Variation R2 at Vin=5V, R1=300k



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## TYPICAL CHARACTERISTIC CURVES

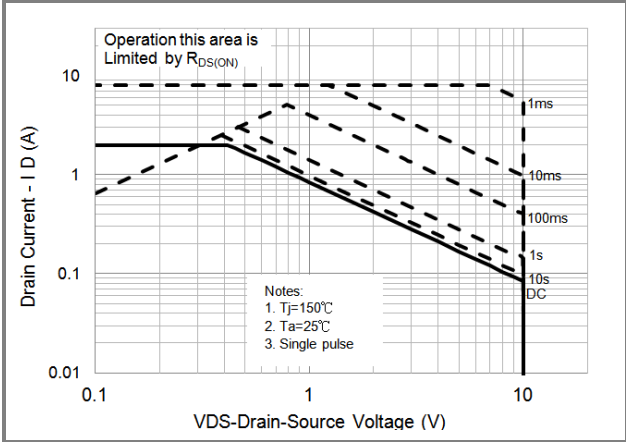


Fig.13 Switching Variation R2 at  $V_{in}=12\text{V}$ ,  $R_1=20\text{k}\Omega$

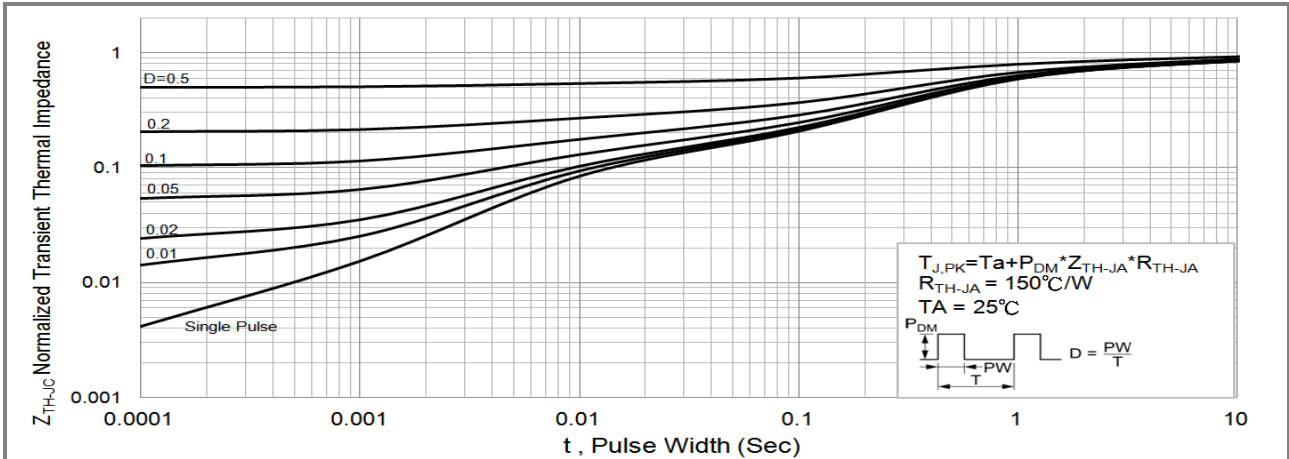


Fig.14 Transient Thermal Response Curve

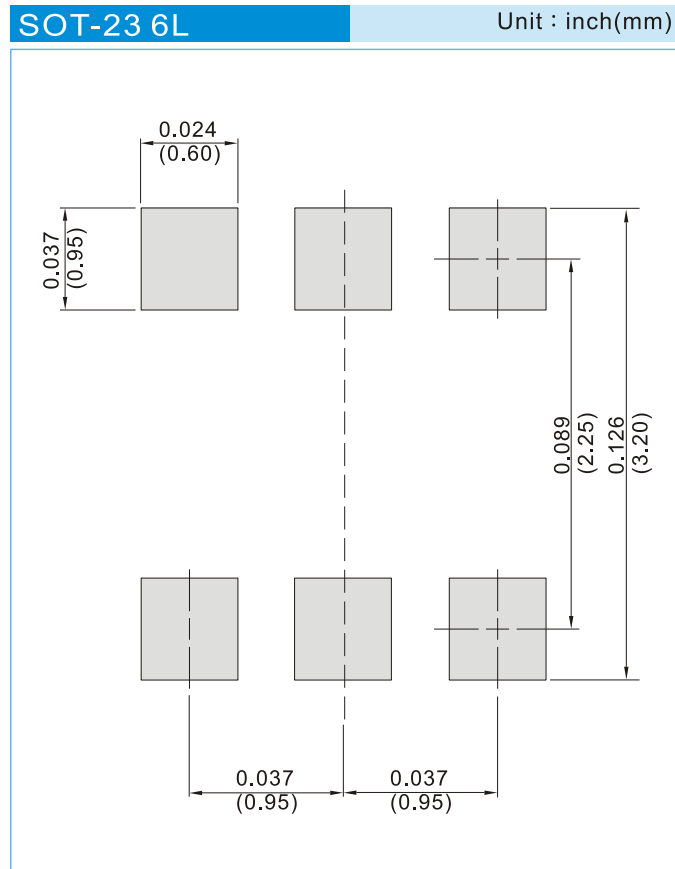


# PJS6631

## PART NO. PACKING CODE VERSION

Part No. Packing Code	Package Type	Packing Type	Marking	Version
PJS6631_S1_00001	SOT-23 6L	3K pcs / 7" reel	SL1	Halogen free RoHS compliant
PJS6631_S2_00001	SOT-23 6L	10K pcs / 13" reel	SL1	Halogen free RoHS compliant

## MOUNTING PAD LAYOUT






## **PJS6631**

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