



# PJS6601-AU

## 20V Complementary Enhancement Mode MOSFET

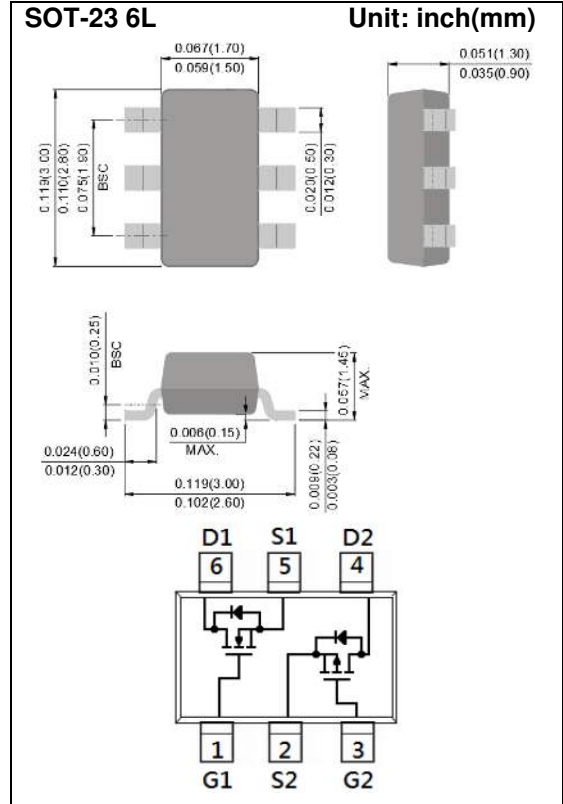
**Voltage** 20 / -20V    **Current** 4.1 / -3.1A

### Features

- Advanced Trench Process Technology
- Specially Designed for Switch Load, PWM Application, etc.
- AEC-Q101 qualified
- 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



### Maximum Ratings and Thermal Characteristics (T<sub>A</sub>=25°C unless otherwise noted)

PARAMETER		SYMBOL	N-Ch LIMIT	P-Ch LIMIT	UNITS
Drain-Source Voltage		V <sub>DS</sub>	20	-20	V
Gate-Source Voltage		V <sub>GS</sub>	±12	±12	
Continuous Drain Current <sup>(Note 4)</sup>		I <sub>D</sub>	4.1	-3.1	A
Pulsed Drain Current <sup>(Note 1)</sup>		I <sub>DM</sub>	16.4	-12.4	
Power Dissipation	T <sub>a</sub> =25°C	P <sub>D</sub>	1.25		W
	Derate above 25°C		10		mW/°C
Operating Junction and Storage Temperature Range		T <sub>J</sub> , T <sub>STG</sub>	-55~150		°C
Typical Thermal Resistance		R <sub>θJA</sub>	100		°C/W
- Junction to Ambient <sup>(Note 3,4)</sup>					



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

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNITS
<b>Static</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	20	-	-	V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	0.4	0.66	1.2	
Drain-Source On-State Resistance	R <sub>DSON</sub>	V <sub>GS</sub> =4.5V, I <sub>D</sub> =4.1A	-	41	56	mΩ
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =2.8A	-	50	68	
		V <sub>GS</sub> =1.8V, I <sub>D</sub> =1.5A	-	66	95	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V	-	-	1	uA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±12V, V <sub>DS</sub> =0V	-	-	±100	nA
<b>Dynamic</b> (Note 5)						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =4.1A, V <sub>GS</sub> =4.5V(Note 1,2)	-	4.6	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	0.8	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	1	-	
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =10V, V <sub>GS</sub> =0V, f=1MHZ	-	350	-	pF
Output Capacitance	C <sub>oss</sub>		-	40	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	29	-	
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> =10V, I <sub>D</sub> =4.1A, V <sub>GS</sub> =4.5V, R <sub>G</sub> =6Ω(Note 1,2)	-	4	-	ns
Turn-On Rise Time	t <sub>r</sub>		-	47	-	
Turn-Off Delay Time	t <sub>d(off)</sub>		-	18	-	
Turn-Off Fall Time	t <sub>f</sub>		-	10	-	
<b>Drain-Source Diode</b>						
Maximum Continuous Drain-Source Diode Forward Current	I <sub>S</sub>	---	-	-	1.5	A
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =1A, V <sub>GS</sub> =0V	-	0.75	1.2	V



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

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNITS
<b>Static</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =-250uA	-20	-	-	V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250uA	-0.4	-0.71	-1.2	
Drain-Source On-State Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-3.1A	-	97	115	mΩ
		V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-2.0A	-	119	140	
		V <sub>GS</sub> =-1.8V, I <sub>D</sub> =-1.1A	-	157	190	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =-20V, V <sub>GS</sub> =0V	-	-	-1	uA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±12V, V <sub>DS</sub> =0V	-	-	±100	nA
<b>Dynamic</b> <sup>(Note 5)</sup>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =-10V, I <sub>D</sub> =-3.1A, V <sub>GS</sub> =-4.5V <sup>(Note 1,2)</sup>	-	5.4	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	0.7	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	1.3	-	
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =-10V, V <sub>GS</sub> =0V, f=1MHZ	-	416	-	pF
Output Capacitance	C <sub>oss</sub>		-	43	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	32	-	
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> =-10V, I <sub>D</sub> =-3.1A, V <sub>GS</sub> =-4.5V, R <sub>G</sub> =6Ω <sup>(Note 1,2)</sup>	-	4	-	ns
Turn-On Rise Time	t <sub>r</sub>		-	27	-	
Turn-Off Delay Time	t <sub>d(off)</sub>		-	78	-	
Turn-Off Fall Time	t <sub>f</sub>		-	45	-	
<b>Drain-Source Diode</b>						
Maximum Continuous Drain-Source Diode Forward Current	I <sub>S</sub>	---	-	-	-1.5	A
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =-1A, V <sub>GS</sub> =0V	-	-0.8	-1.2	V

**NOTES :**

1. Pulse width ≤ 300us, Duty cycle ≤ 2%
2. Essentially independent of operating temperature typical characteristics.
3. 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.
4. The maximum current rating is package limited.
5. Guaranteed by design, not subject to production testing.



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## N-Channel TYPICAL CHARACTERISTIC CURVES

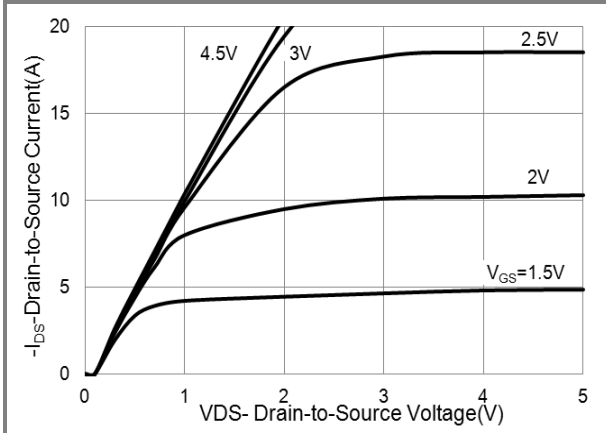


Fig.1 On-Region Characteristics

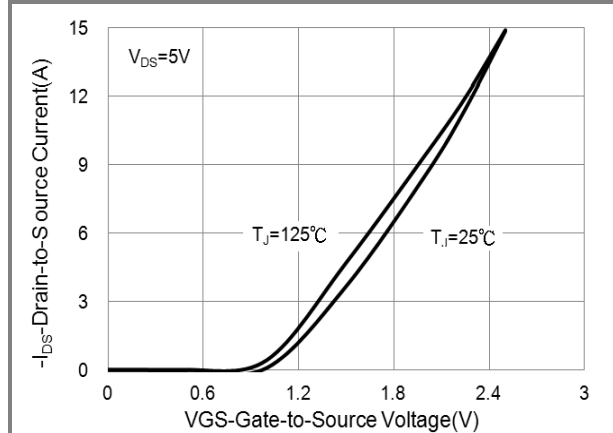


Fig.2 Transfer Characteristics

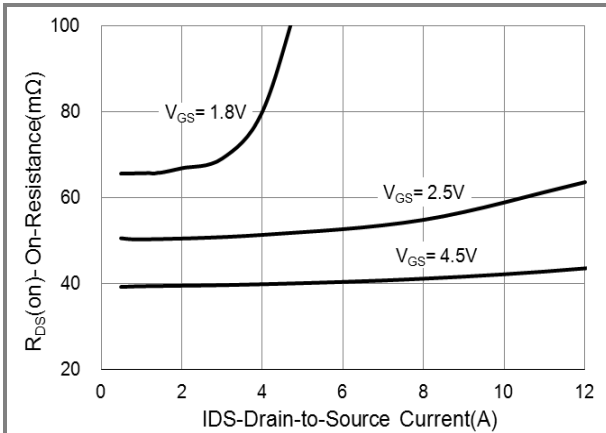


Fig.3 On-Resistance vs. Drain Current

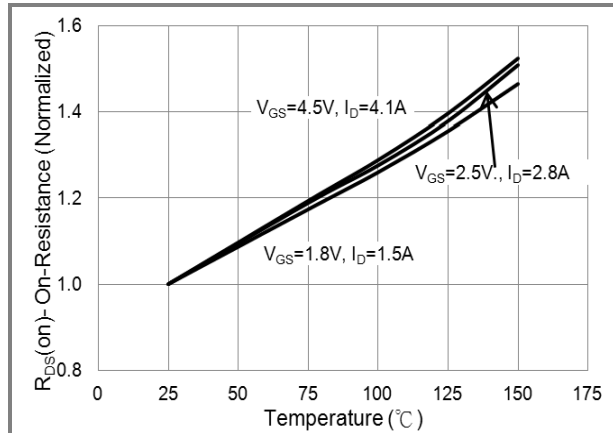


Fig.4 On-Resistance vs. Junction temperature

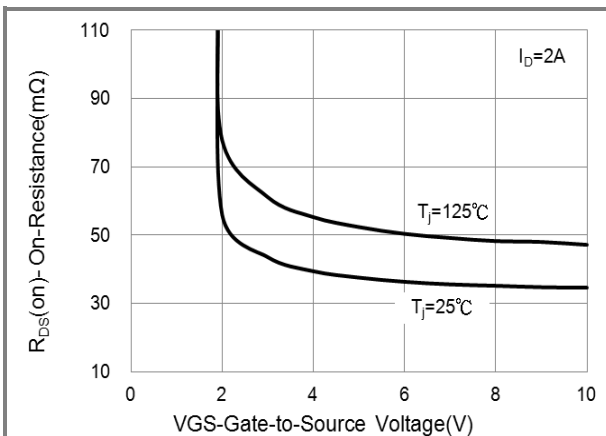


Fig.5 On-Resistance Variation with  $V_{GS}$

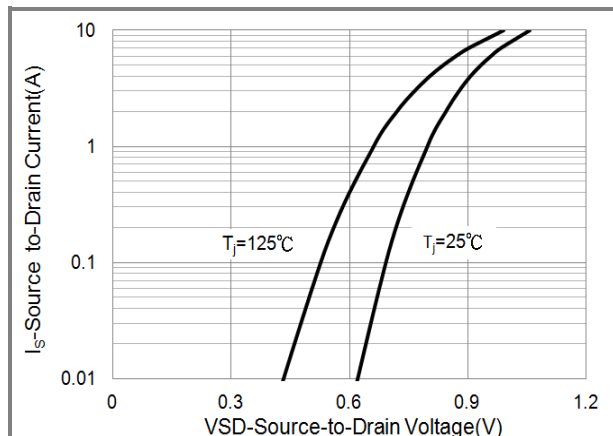


Fig.6 Body Diode Characteristics



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## N-Channel TYPICAL CHARACTERISTIC CURVES

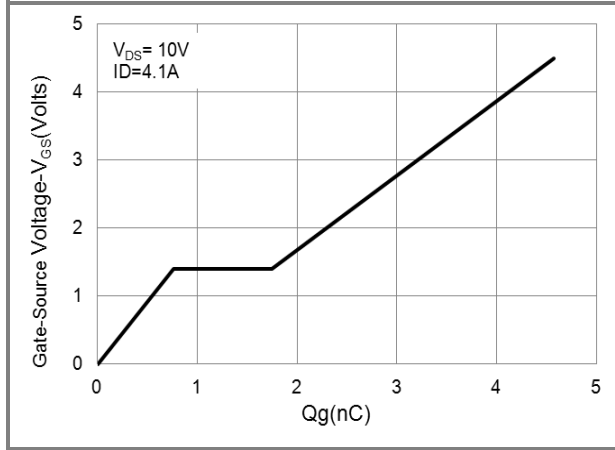


Fig.7 Gate-Charge Characteristics

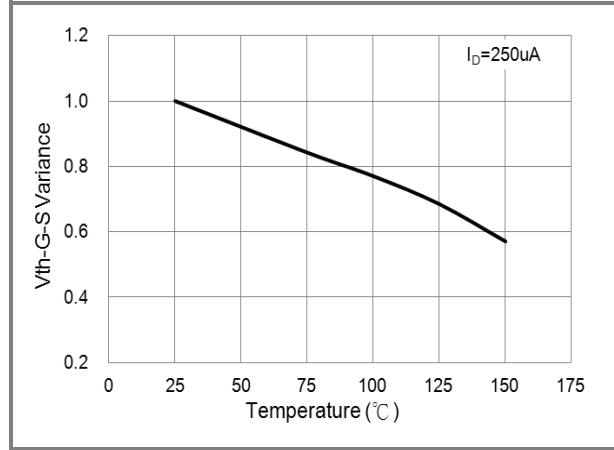


Fig.8 Threshold Voltage Variation with Temperature

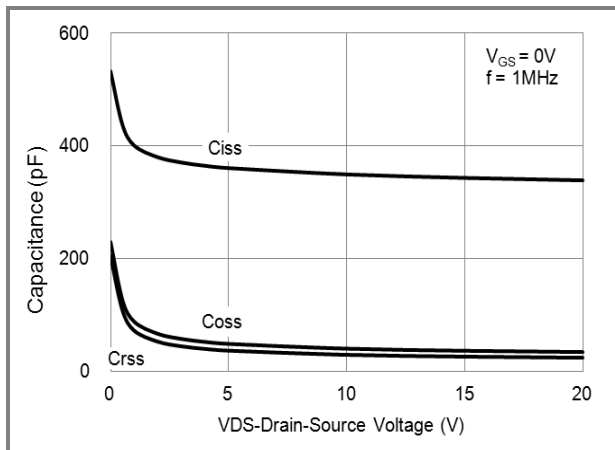


Fig.9 Capacitance vs. Drain-Source Voltage



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## P-Channel TYPICAL CHARACTERISTIC CURVES

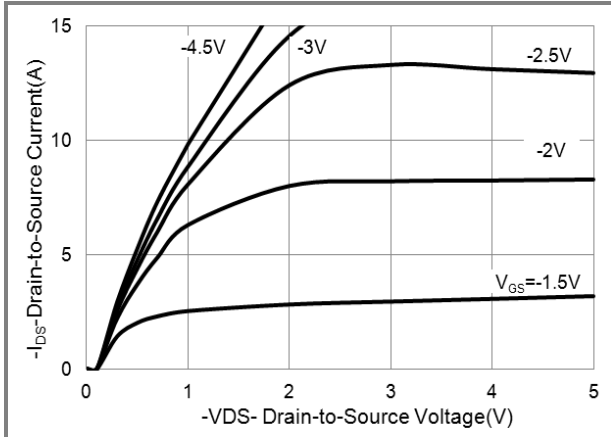


Fig.1 On-Region Characteristics

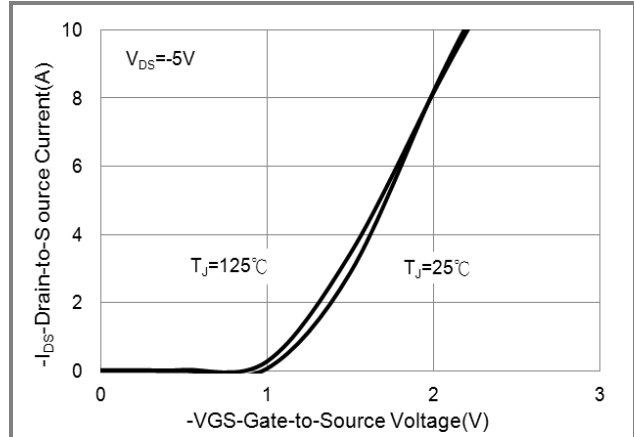


Fig.2 Transfer Characteristics

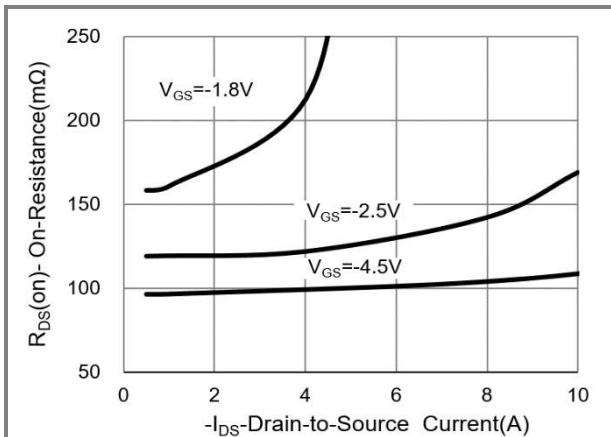


Fig.3 On-Resistance vs. Drain Current

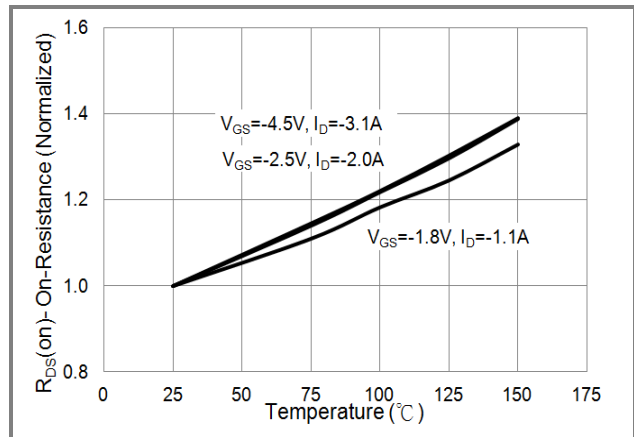


Fig.4 On-Resistance vs. Junction temperature

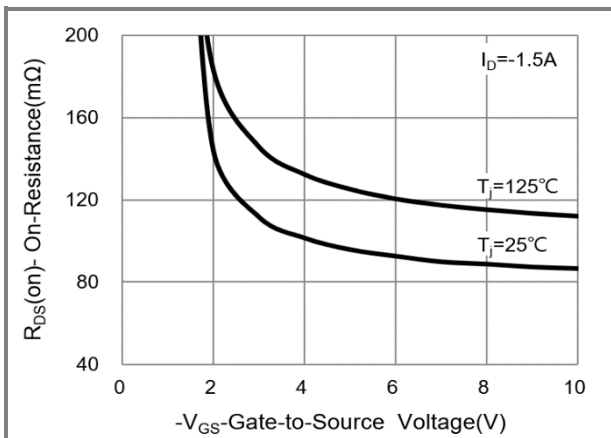


Fig.5 On-Resistance Variation with  $V_{G_S}$

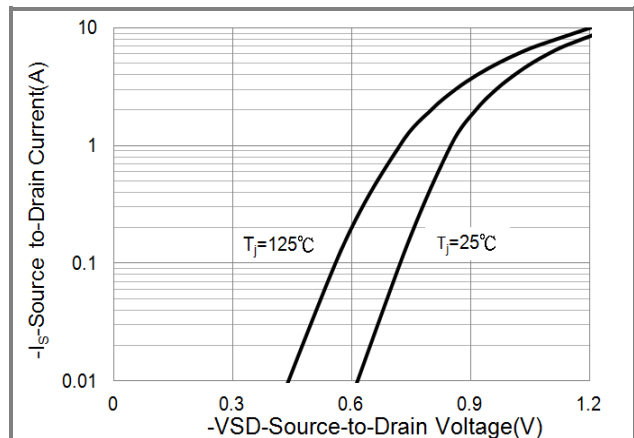


Fig.6 Body Diode Characteristics



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## P-Channel TYPICAL CHARACTERISTIC CURVES

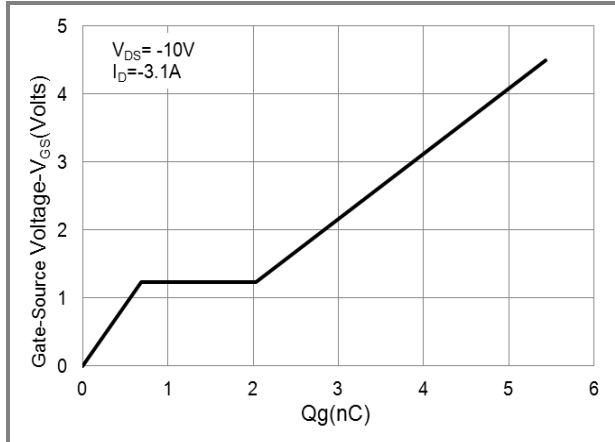


Fig.7 Gate-Charge Characteristics

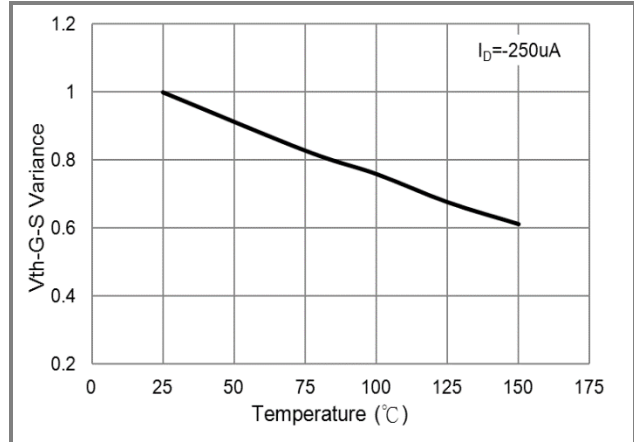


Fig.8 Threshold Voltage Variation with Temperature

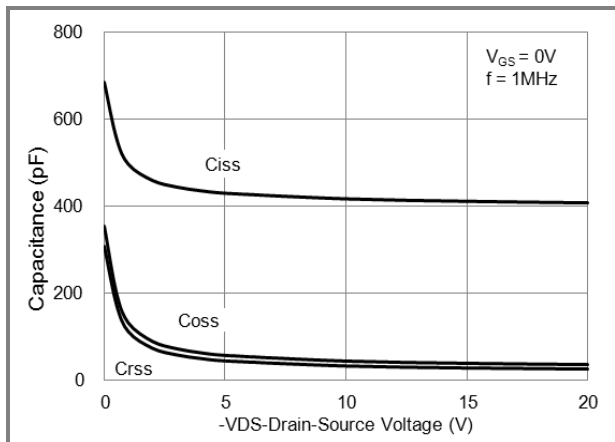


Fig.9 Threshold Voltage Variation with Temperature

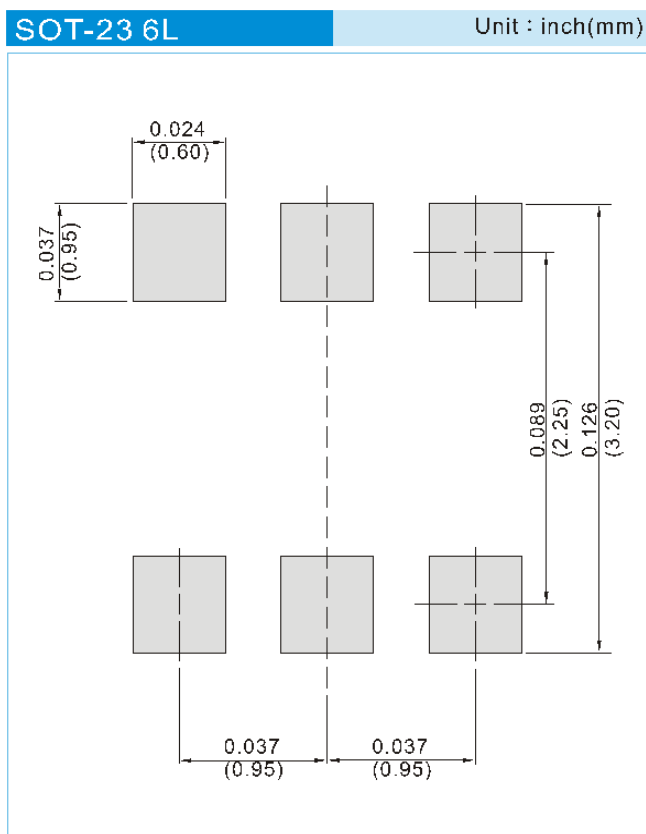


# PJS6601-AU

## Part No. Packing Code Version

Part No. Packing Code	Package Type	Packing Type	Marking	Version
PJS6601-AU_S1_000A1	SOT-23 6L	3K pcs / 7" reel	SC1	Halogen free RoHS compliant

## Mounting Pad Layout







## **PJS6601-AU**

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