



# PJT7603

## Complementary Enhancement Mode MOSFET – ESD Protected

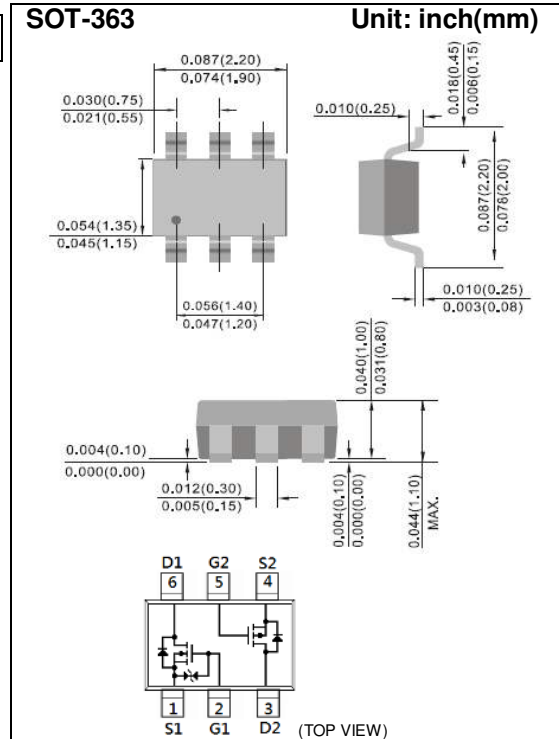
**Voltage** 50 / -60V **Current** 0.4A / -0.25A

### Features

- Advanced Trench Process Technology
- Specially Designed for Switch Load, PWM Application, etc.
- ESD Protected 2KV HBM
- Lead free in compliance with EU RoHS 2011/65/EU directive
- Green molding compound as per IEC61249 Std. (Halogen Free)

### Mechanical Data

- Case: SOT-363 Package
- Terminals: Solderable per MIL-STD-750, Method 2026
- Approx. Weight: 0.0002 ounces, 0.006 grams



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

PARAMETER	SYMBOL	N-Ch LIMIT	P-Ch LIMIT	UNITS	
Drain-Source Voltage	$V_{DS}$	50	-60	V	
Gate-Source Voltage	$V_{GS}$	$\pm 20$	$\pm 20$	V	
Continuous Drain Current	$I_D$	400	-250	mA	
Pulsed Drain Current (Note 4)	$I_{DM}$	1200	-900	mA	
Power Dissipation	$P_D$	$T_a=25^\circ\text{C}$		350	mW
		Derate above $25^\circ\text{C}$		2.8	mW/ $^\circ\text{C}$
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55~150		$^\circ\text{C}$	
Typical Thermal resistance	$R_{\theta JA}$			357	$^\circ\text{C/W}$
- Junction to Ambient (Note 3)					



# PJT7603

## 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	50	-	-	V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> = 250uA	0.5	0.9	1.0	V
Drain-Source On-State Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 500mA	-	1.2	1.5	Ω
		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 200mA	-	1.3	2.5	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 50V, V <sub>GS</sub> =0V	-	-	1	uA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	-	-	±10	uA
<b>Dynamic</b> (Note 5)						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =25V, I <sub>D</sub> =500mA, V <sub>GS</sub> =4.5V	-	0.95	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	0.34	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	0.32	-	
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1.0MHZ	-	36	-	pF
Output Capacitance	C <sub>oss</sub>		-	11	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	6.6	-	
Turn-On Delay Time	td <sub>(on)</sub>	V <sub>DD</sub> =25V, I <sub>D</sub> =500mA, V <sub>GS</sub> =10V, R <sub>G</sub> =6Ω (Note 1,2)	-	2.3	-	ns
Turn-On Rise Time	tr		-	20	-	
Turn-Off Delay Time	td <sub>(off)</sub>		-	7	-	
Turn-Off Fall Time	tf		-	20	-	
<b>Drain-Source Diode</b>						
Maximum Continuous Drain-Source Diode Forward Current	I <sub>S</sub>	---	-	-	400	mA
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> = 500mA, V <sub>GS</sub> =0V	-	0.9	1.5	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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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	-60	-	-	V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250uA	-1.0	-1.5	-2.5	V
Drain-Source On-State Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =-10V, I <sub>D</sub> =-500mA	-	2.4	4	Ω
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-200mA	-	2.7	6	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =-48V, V <sub>GS</sub> =0V	-	-	-1	uA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	-	-	±100	nA
<b>Dynamic</b> (Note 5)						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =-25V, I <sub>D</sub> =-100mA, V <sub>GS</sub> =-4.5V	-	1.1	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	0.3	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	0.2	-	
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =-25V, V <sub>GS</sub> =0V, f=1.0MHZ	-	51	-	pF
Output Capacitance	C <sub>oss</sub>		-	15	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	2.2	-	
Turn-On Delay Time	td <sub>(on)</sub>	V <sub>DD</sub> =-25V, I <sub>D</sub> =-100mA, V <sub>GS</sub> =-10V, R <sub>G</sub> =6Ω (Note 1,2)	-	4.8	-	ns
Turn-On Rise Time	tr		-	19	-	
Turn-Off Delay Time	td <sub>(off)</sub>		-	52	-	
Turn-Off Fall Time	tf		-	32	-	
<b>Drain-Source Diode</b>						
Maximum Continuous Drain-Source Diode Forward Current	I <sub>S</sub>	---	-	-	-250	mA
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =-500mA, V <sub>GS</sub> =0V	-	-0.9	-1.5	V



# PJT7603

## N-Channel TYPICAL CHARACTERISTIC CURVES

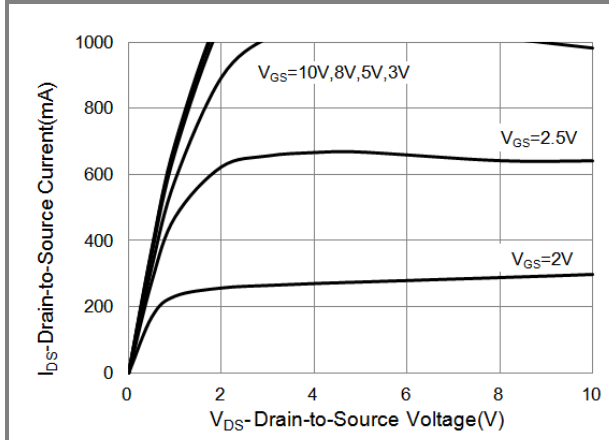


Fig.1 On-Region Characteristics

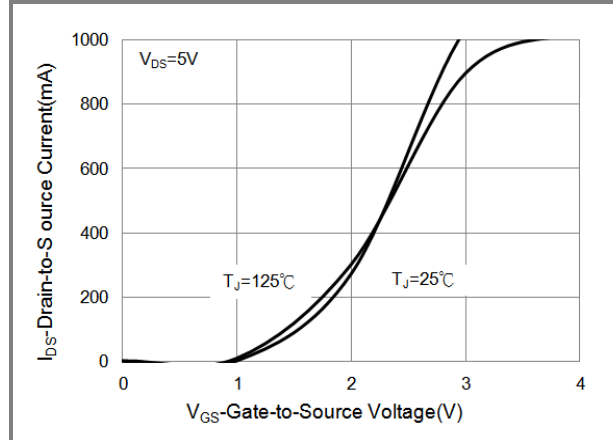


Fig.2 Transfer Characteristics

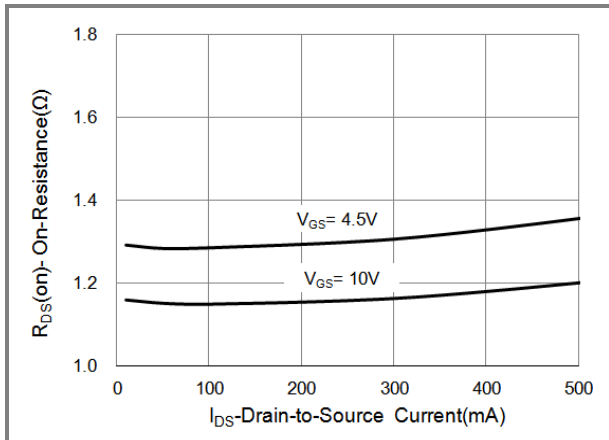


Fig.3 On-Resistance vs. Drain Current

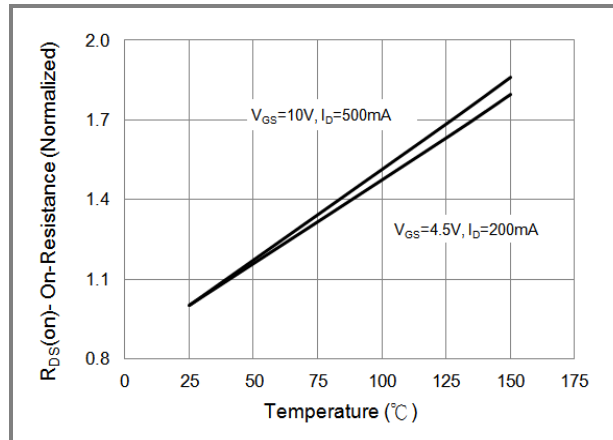


Fig.4 On-Resistance vs. Junction temperature

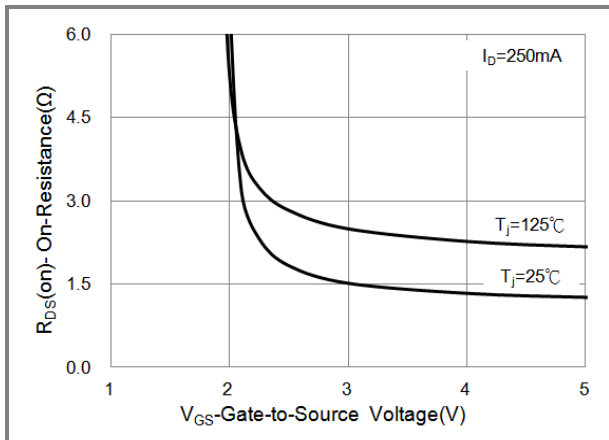


Fig.5 On-Resistance Variation with VGS.

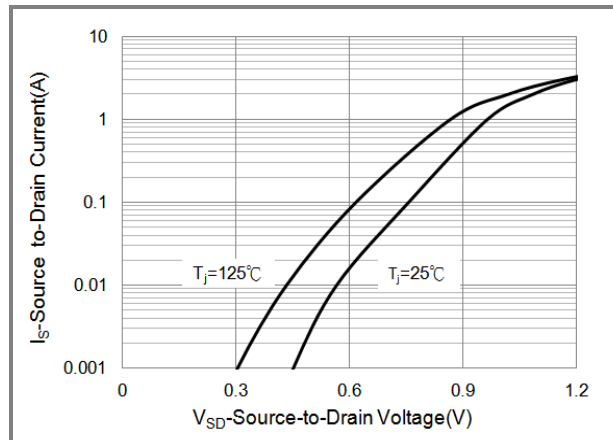


Fig.6 Body Diode Characteristics



# PJT7603

## N-Channel TYPICAL CHARACTERISTIC CURVES

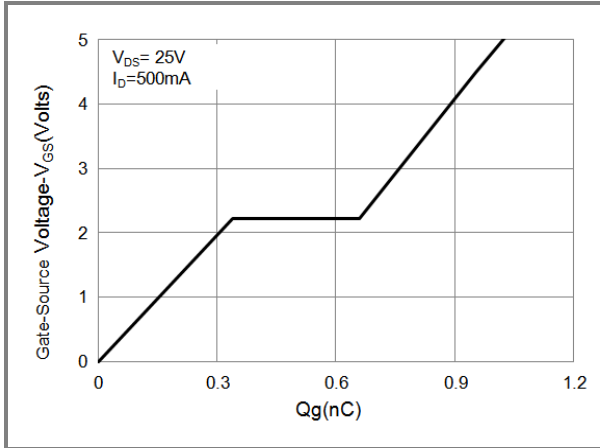


Fig.7 Gate-Charge Characteristics

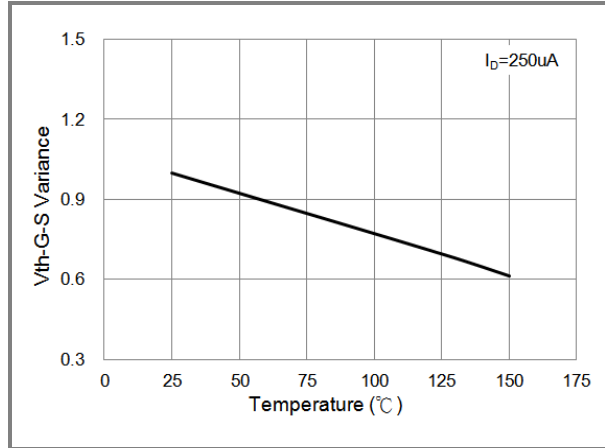


Fig.8 Threshold Voltage Variation with Temperature.

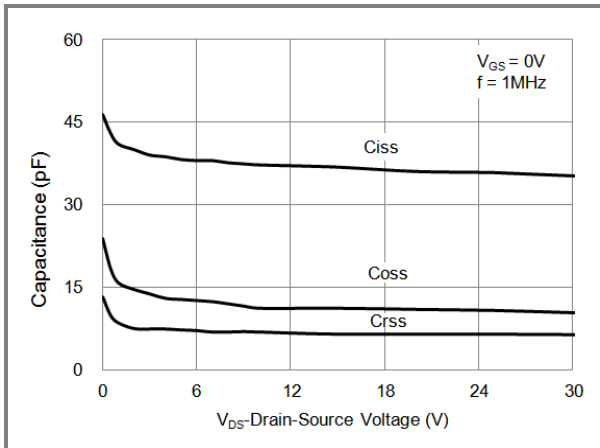
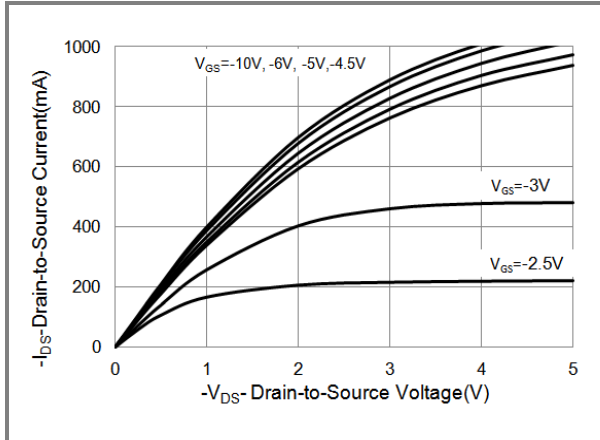


Fig.9 Capacitance vs. Drain-Source Voltage.

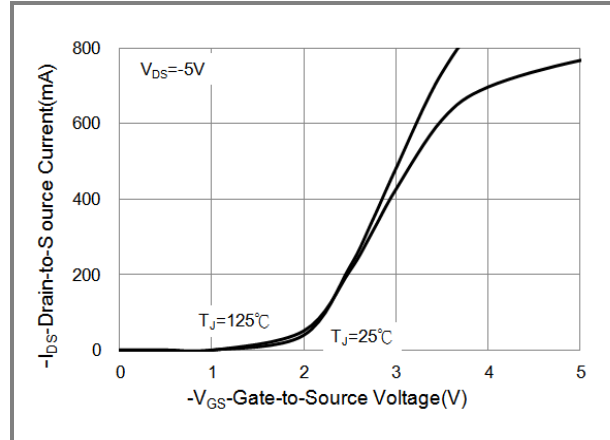


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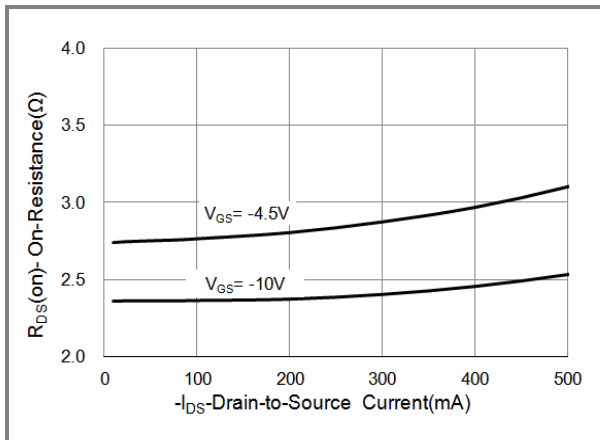
## P-Channel TYPICAL CHARACTERISTIC CURVES



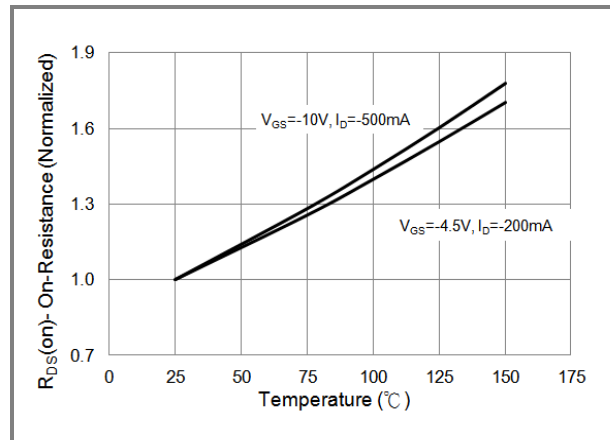
**Fig.1 On-Region Characteristics**



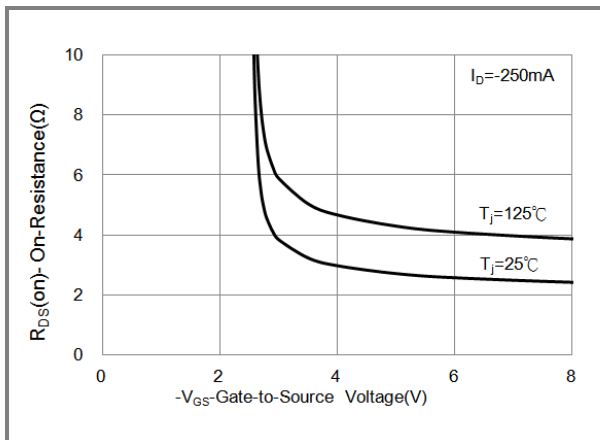
**Fig.2 Transfer Characteristics**



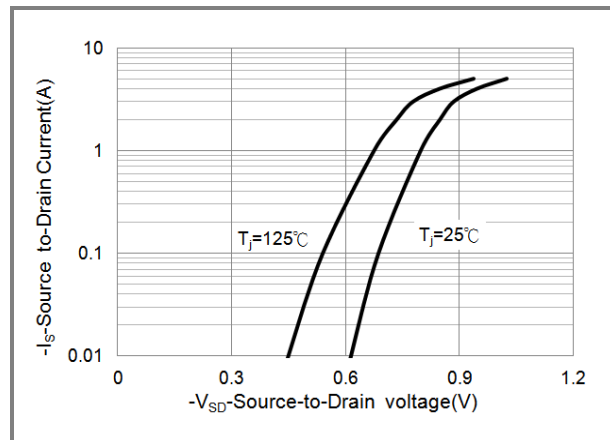
**Fig.3 On-Resistance vs. Drain Current**



**Fig.4 On-Resistance vs. Junction temperature**



**Fig.5 On-Resistance Variation with VGS.**



**Fig.6 Body Diode Characteristics**



# PJT7603

## P-Channel TYPICAL CHARACTERISTIC CURVES

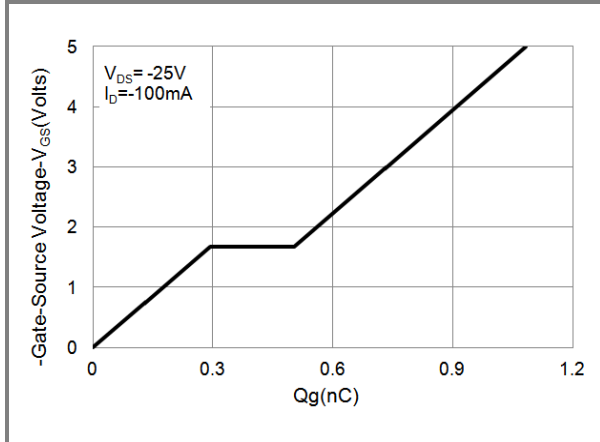


Fig.7 Gate-Charge Characteristics

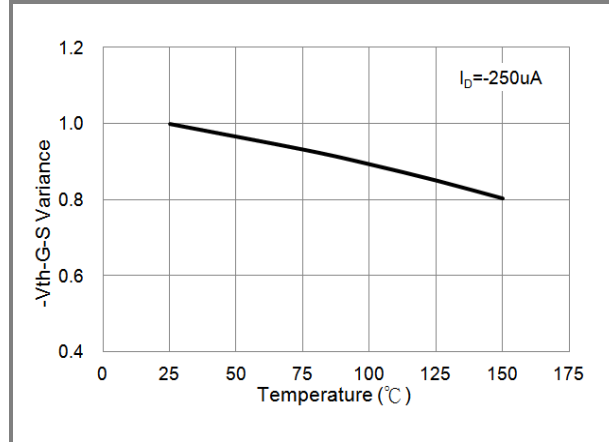


Fig.8 Threshold Voltage Variation with Temperature.

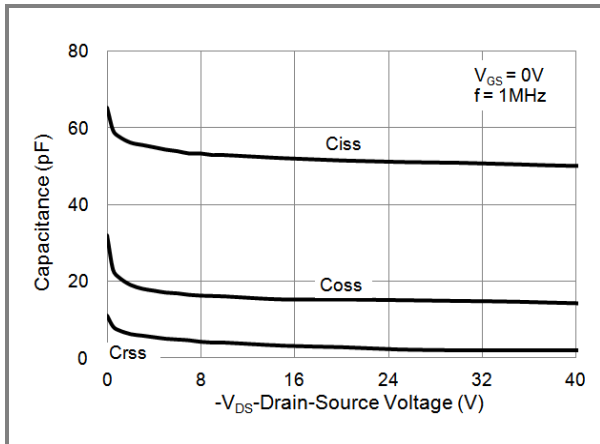


Fig.9 Threshold Voltage Variation with Temperature.

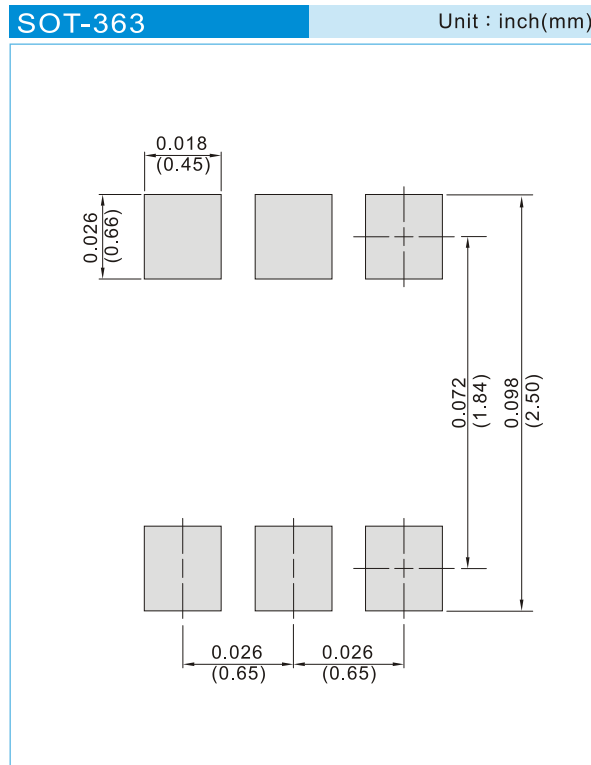


# PJT7603

## PART NO PACKING CODE VERSION

Part No Packing Code	Package Type	Packing type	Marking	Version
PJT7603_R1_00001	SOT-363	3K pcs / 7" reel	T63	Halogen free
PJT7603_R2_00001	SOT-363	10K pcs / 13" reel	T63	Halogen free

## MOUNTING PAD LAYOUT







## PJT7603

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