



PJT7838

50V N-Channel Enhancement Mode MOSFET

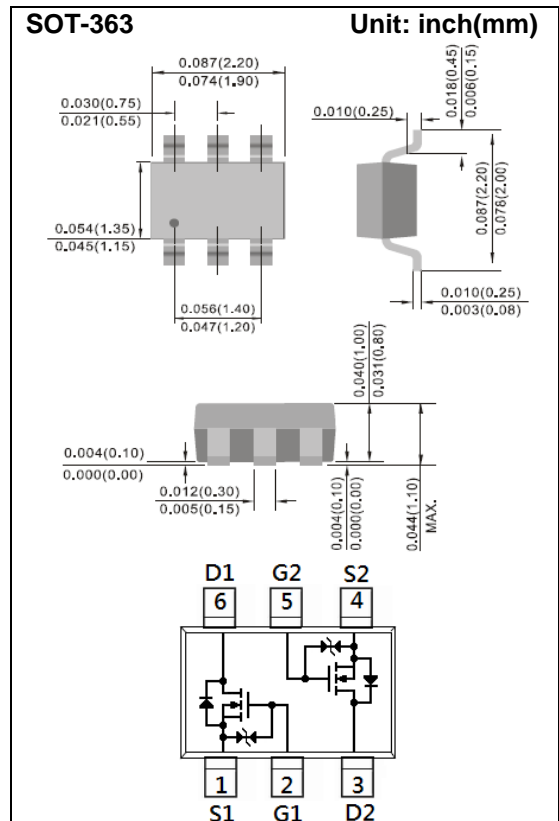
Voltage 50 V **Current** 400mA

Features

- RDS(ON) , VGS@10V, ID@500mA<1.45Ω
- RDS(ON) , VGS@4.5V, ID@200mA<1.95Ω
- RDS(ON) , VGS@2.5V, ID@100mA<4.0Ω
- RDS(ON) , VGS@1.8V, ID@10mA<4.0Ω(typ.)
- Advanced Trench Process Technology
- ESD Protected 2KV HBM
- Specially Designed for Relay driver, Speed line drive, etc.
- 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
- Marking: T38



Maximum Ratings and Thermal Characteristics (T_A=25°C unless otherwise noted)

PARAMETER	SYMBOL	LIMIT	UNITS	
Drain-Source Voltage	V _{DS}	50	V	
Gate-Source Voltage	V _{GS}	+20	V	
Continuous Drain Current	I _D	400	mA	
Pulsed Drain Current	I _{DM}	1200	mA	
Power Dissipation	P _D	T _A =25°C	350	mW
		Derate above 25°C	2.8	mW/°C
Operating Junction and Storage Temperature Range	T _J , T _{STG}	-55~150	°C	
Typical Thermal resistance	R _{θJA}	357	°C/W	
- Junction to Ambient (Note 3)				



PJT7838

Electrical Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNITS
Static						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	50	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.5	0.86	1.0	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=500mA$	-	1.2	1.45	Ω
		$V_{GS}=4.5V, I_D=200mA$	-	1.3	1.95	
		$V_{GS}=2.5V, I_D=100mA$	-	1.7	4.0	
		$V_{GS}=1.8V, I_D=10mA$	-	4.0	-	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=50V, V_{GS}=0V$	-	-	1	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 10	μA
Dynamic (Note 4)						
Total Gate Charge	Q_g	$V_{DS}=25V, I_D=500mA,$ $V_{GS}=4.5V$	-	0.95	-	nC
Gate-Source Charge	Q_{gs}		-	0.34	-	
Gate-Drain Charge	Q_{gd}		-	0.32	-	
Input Capacitance	C_{iss}	$V_{DS}=25V, V_{GS}=0V,$ $f=1.0MHz$	-	36	-	pF
Output Capacitance	C_{oss}		-	11	-	
Reverse Transfer Capacitance	C_{rss}		-	6.6	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=25V, I_D=500mA,$ $V_{GS}=10V,$ $R_G=6\Omega$ (Note 1,2)	-	2.3	-	ns
Turn-On Rise Time	t_r		-	20	-	
Turn-Off Delay Time	$t_{d(off)}$		-	7	-	
Turn-Off Fall Time	t_f		-	20	-	
Drain-Source Diode						
Maximum Continuous Drain-Source Diode Forward Current	I_S	---	-	-	500	mA
Diode Forward Voltage	V_{SD}	$I_S=500mA, V_{GS}=0V$	-	0.9	1.5	V

NOTES :

1. Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$
2. Essentially independent of operating temperature typical characteristics.
3. $R_{\theta JA}$ 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 square pad of copper
4. Guaranteed by design, not subject to production testing.



PJT7838

TYPICAL CHARACTERISTIC CURVES

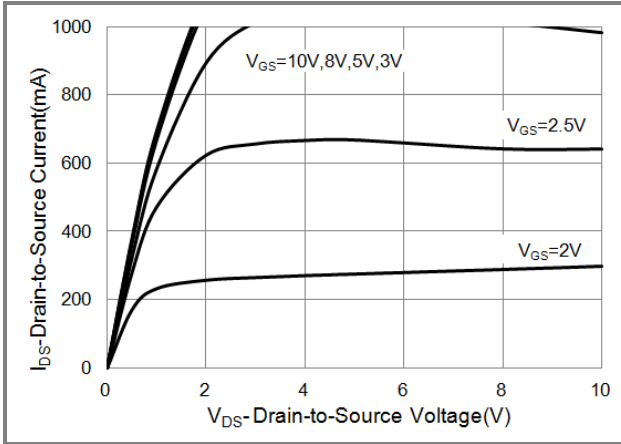


Fig.1 On-Region Characteristics

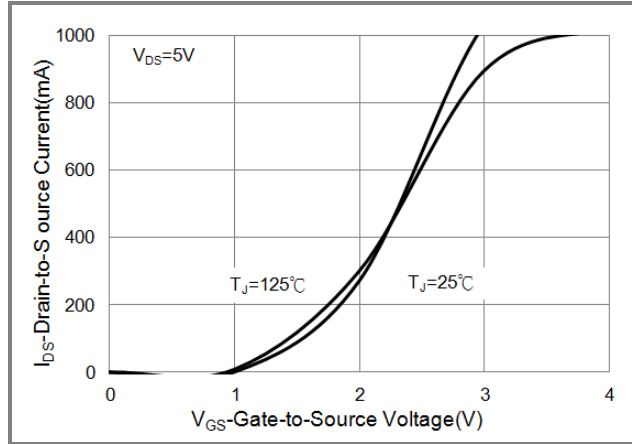


Fig.2 Transfer Characteristics

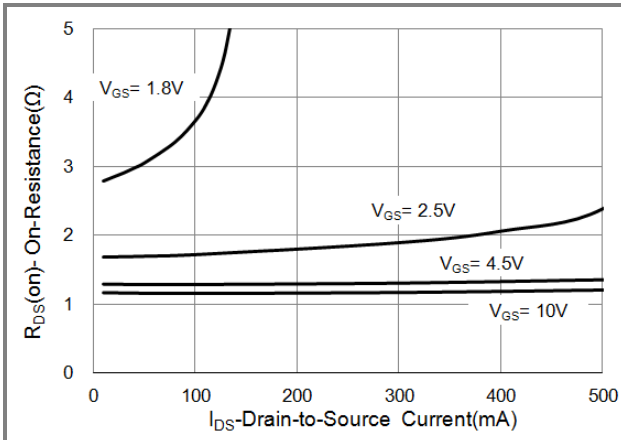


Fig.3 On-Resistance vs. Drain Current

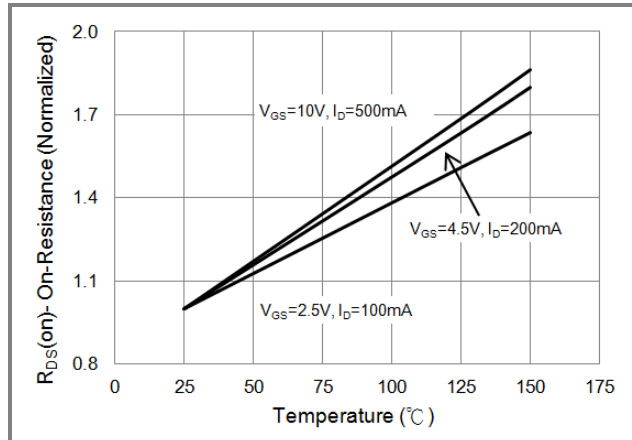


Fig.4 On-Resistance vs. Junction temperature

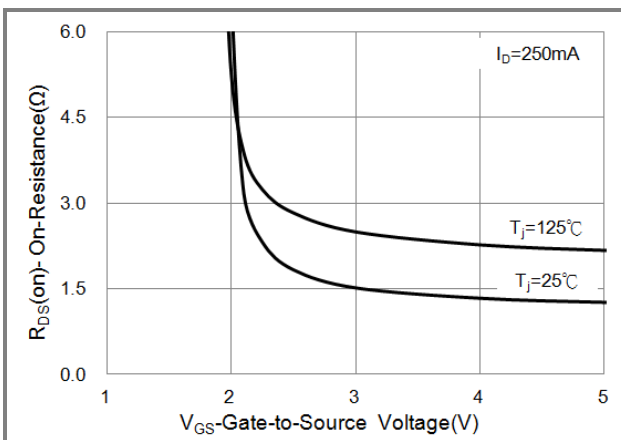


Fig.5 On-Resistance Variation with VGS.

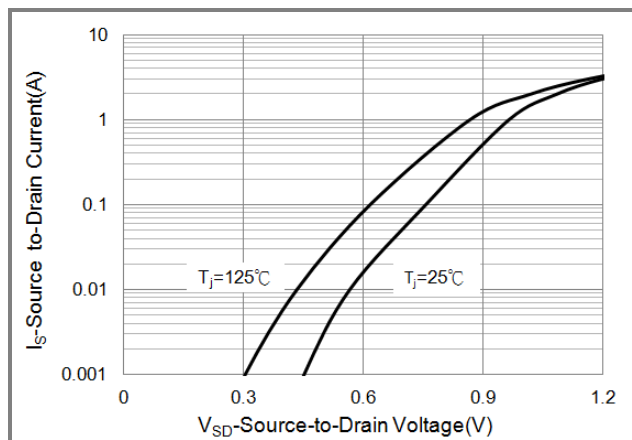


Fig.6 Body Diode Characteristics



PJT7838

TYPICAL CHARACTERISTIC CURVES

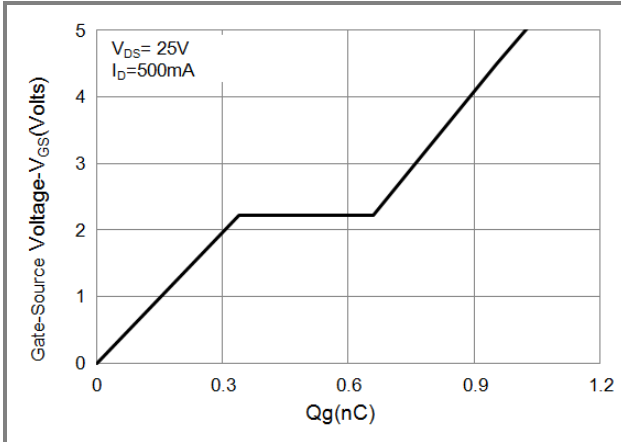


Fig.7 Gate-Charge Characteristics

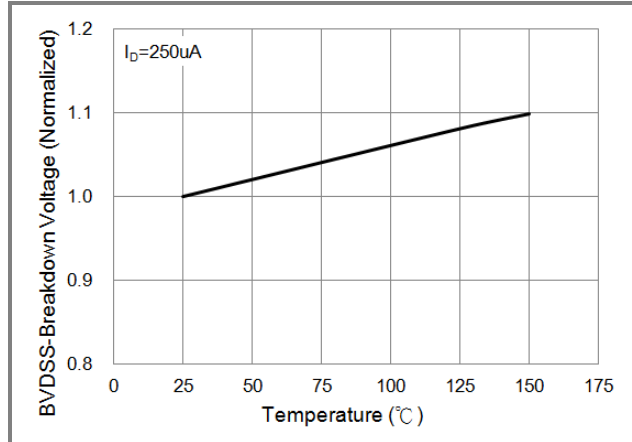


Fig.8 Breakdown Voltage Variation vs. Temperature

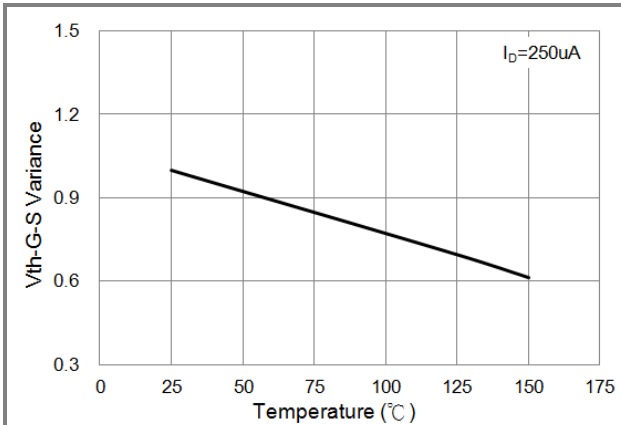


Fig.9 Threshold Voltage Variation with Temperature.

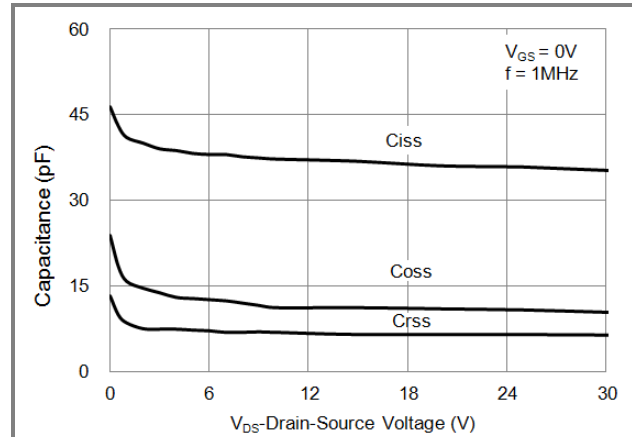


Fig.10 Capacitance vs. Drain-Source Voltage.

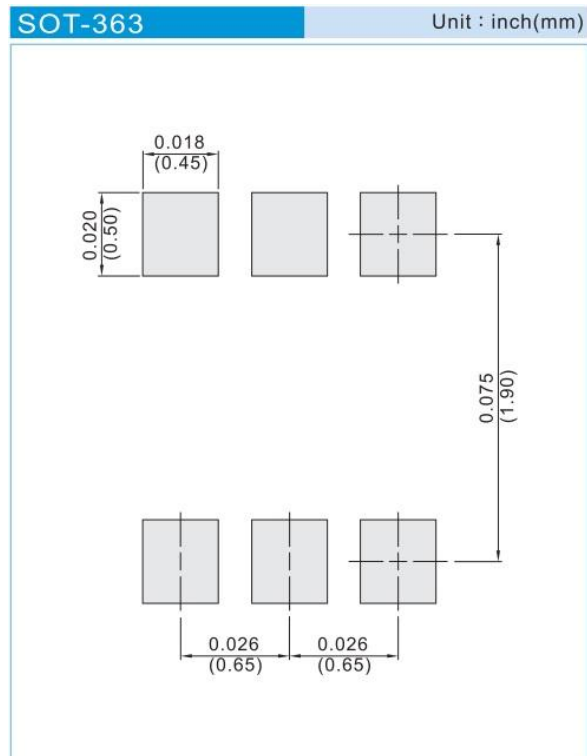


PJT7838

PART NO PACKING CODE VERSION

Part No Packing Code	Package Type	Packing type	Marking	Version
PJT7838_R1_00001	SOT-363	3K pcs / 7" reel	T38	Halogen free
PJT7838_R2_00001	SOT-363	10K pcs / 13" reel	T38	Halogen free

MOUNTING PAD LAYOUT





PJT7838

Disclaimer

- Reproducing and modifying information of the document is prohibited without permission from Panjit International Inc..
- Panjit International Inc. reserves the rights to make changes of the content herein the document anytime without notification. Please refer to our website for the latest document.
- Panjit International Inc. disclaims any and all liability arising out of the application or use of any product including damages incidentally and consequentially occurred.
- Panjit International Inc. does not assume any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.
- Applications shown on the herein document are examples of standard use and operation. Customers are responsible in comprehending the suitable use in particular applications. Panjit International Inc. makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.
- The products shown herein are not designed and authorized for equipments requiring high level of reliability or relating to human life and for any applications concerning life-saving or life-sustaining, such as medical instruments, transportation equipment, aerospace machinery et cetera. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Panjit International Inc. for any damages resulting from such improper use or sale.
- Since Panjit uses lot number as the tracking base, please provide the lot number for tracking when complaining.