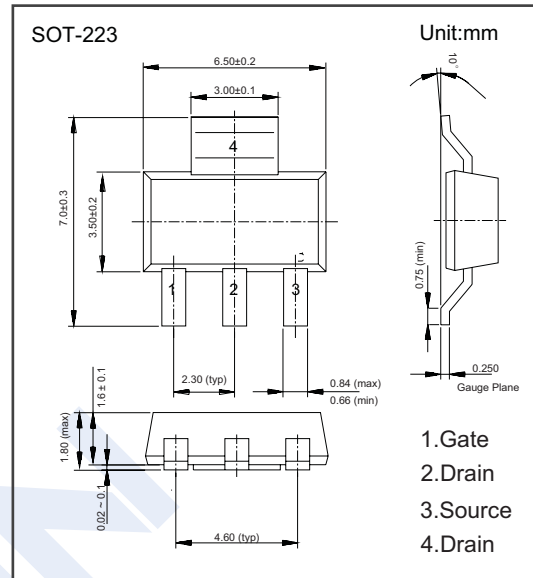
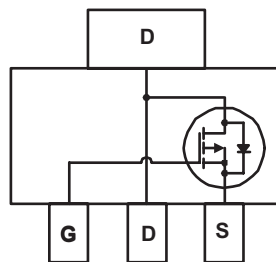


## P-Channel MOSFET

### 2SJ3001

#### ■ Features

- -0.67 A, -200 V,  $R_{DS(on)} = 2.7\Omega$  (Max.)  
@  $V_{GS} = -10V$ ,  $I_D = -0.335 A$
- Low Gate Charge (Typ. 6.0 nC)
- Low  $C_{rss}$  (Typ. 7.5 pF)



#### ■ Absolute Maximum Ratings $T_c = 25^\circ C$ unless otherwise noted.

Parameter	Symbol	Rating	Unit	
Drain-Source Voltage	$V_{DS}$	-200	V	
Gate-Source Voltage	$V_{GS}$	$\pm 30$		
Continuous Drain Current	$I_D$	$T_c=25^\circ C$	-0.67	A
		$T_c=70^\circ C$	-0.53	
Pulsed Drain Current	$I_{DM}$	-2.7		
Single Pulsed Avalanche Energy	$E_{AS}$	150	mJ	
Avalanche Current	$I_{AR}$	-0.67	A	
Repetitive Avalanche Energy	$E_{AR}$	0.25	mJ	
Peak Diode Recovery $dv/dt$	$dv/dt$	-5.5	V/ns	
Power Dissipation	$P_D$	$T_c=25^\circ C$	2.5	W
		- Derate above $25^\circ C$	0.02	W/ $^\circ C$
Thermal Resistance.Junction- to-Ambient	$R_{thJA}$	50	$^\circ C/W$	
Junction Temperature	$T_J$	150	$^\circ C$	
Storage Temperature Range	$T_{stg}$	-55 to 150		
Maximum lead temperature for soldering purposes, 1/8 from case for 5 seconds	$T_L$	300		

#### Notes:

1. Repetitive Rating : Pulse width limited by maximum junction temperature
2.  $L = 500mH$ ,  $I_{AS} = -0.67A$ ,  $V_{DD} = -50V$ ,  $R_G = 25 \Omega$ , Starting  $T_J = 25^\circ C$
3.  $I_{SD} \leq -2.8A$ ,  $di/dt \leq 300A/\mu s$ ,  $V_{DD} \leq BV_{DSS}$ , Starting  $T_J = 25^\circ C$

## P-Channel MOSFET

### 2SJ3001

#### ■ Electrical Characteristics $T_C = 25^\circ\text{C}$ unless otherwise noted.

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$BV_{DSS}$	$I_D = -250\mu\text{A}$ , $V_{GS} = 0\text{V}$	-200			V
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	$I_D = -250\mu\text{A}$ , Referenced to $25^\circ\text{C}$		-0.18		$\text{V}/^\circ\text{C}$
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -200\text{V}$ , $V_{GS} = 0\text{V}$			-1	$\mu\text{A}$
		$V_{DS} = -160\text{V}$ , $T_C = 125^\circ\text{C}$			-10	
Gate-Body Leakage Current	$I_{GSS}$	$V_{DS} = 0\text{V}$ , $V_{GS} = \pm 30\text{V}$			$\pm 100$	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$ , $I_D = -250\mu\text{A}$	-3.0		-5.0	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = -10\text{V}$ , $I_D = -0.335\text{A}$			2.7	$\Omega$
Forward Transconductance	$g_{FS}$	$V_{DS} = -40\text{V}$ , $I_D = -0.335\text{A}$	0.2			S
Input Capacitance	$C_{iss}$	$V_{DS} = -25\text{V}$ , $V_{GS} = 0\text{V}$ , $f = 1\text{MHz}$		190	250	$\mu\text{F}$
Output Capacitance	$C_{oss}$			45	60	
Reverse Transfer Capacitance	$C_{rss}$			7.5	10	
Total Gate Charge	$Q_g$	$V_{DS} = -160\text{V}$ , $I_D = -2.8\text{A}$ $V_{GS} = -10\text{V}$ (Note 4)		6.0	8.0	nC
Gate Source Charge	$Q_{gs}$			1.7		
Gate Drain Charge	$Q_{gd}$			2.9		
Turn-On DelayTime	$t_{d(on)}$	$V_{DD} = -100\text{V}$ , $I_D = -2.8\text{A}$ $R_G = 25\Omega$ (Note 4)		8.5	25	ns
Turn-On Rise Time	$t_r$			35	80	
Turn-Off DelayTime	$t_{d(off)}$			12	35	
Turn-Off Fall Time	$t_f$			25	60	
Maximum Body-Diode Continuous Current	$I_S$				-0.67	A
Source Current Pulsed	$I_{SM}$				-2.7	
Diode Forward Voltage	$V_{SD}$	$I_S = -0.67\text{A}$ , $V_{GS} = 0\text{V}$			-5.0	V
Reverse Recovery Time	$t_{rr}$	$V_{GS} = 0\text{V}$ , $I_S = -2.8\text{A}$ , $dI_F/dt = 100\text{A}/\mu\text{s}$		100		ns
Reverse Recovery Charge	$Q_{rr}$			0.34		$\mu\text{C}$

Notes: 4. Essentially independent of operating temperature

#### ■ Marking

Marking	J3001
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# P-Channel MOSFET

## 2SJ3001

■ Typical Characteristics

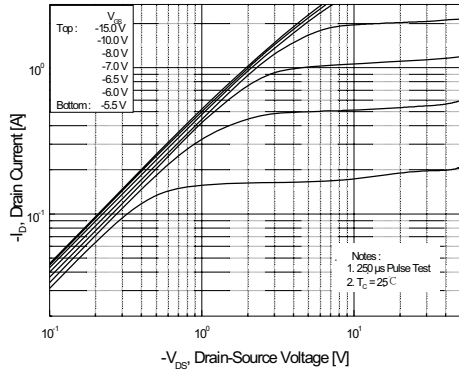


Figure 1. On-Region Characteristics

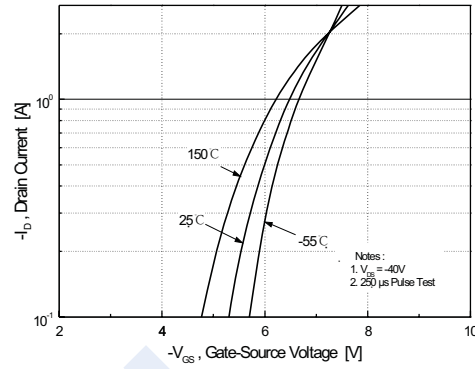


Figure 2. Transfer Characteristics

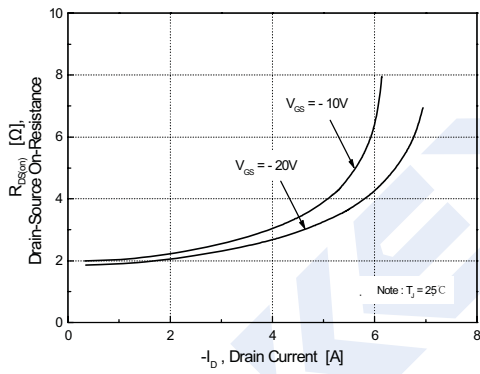


Figure 3. On-Resistance Variation vs. Drain Current and Gate Voltage

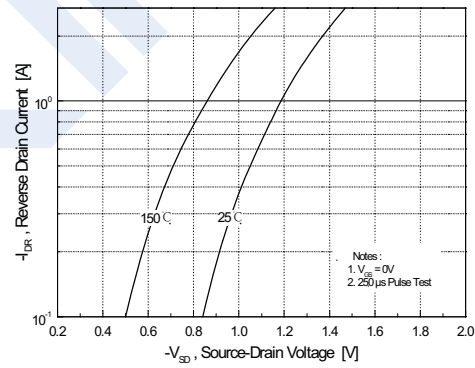


Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperature

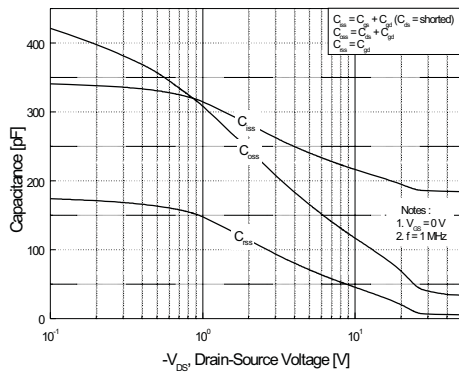


Figure 5. Capacitance Characteristics

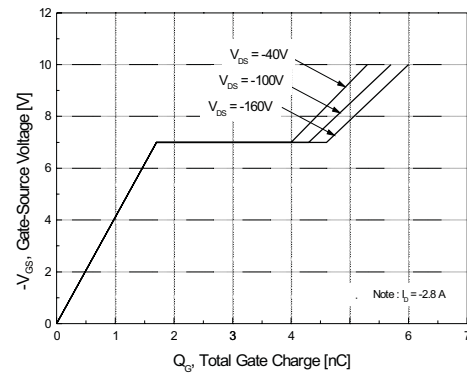


Figure 6. Gate Charge Characteristics

## P-Channel MOSFET 2SJ3001

■ Typical Characteristics (Continued)

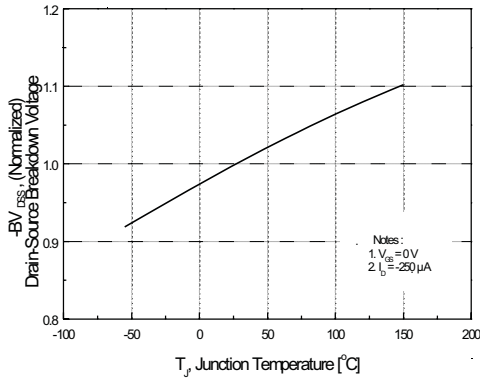


Figure 7. Breakdown Voltage Variation vs. Temperature

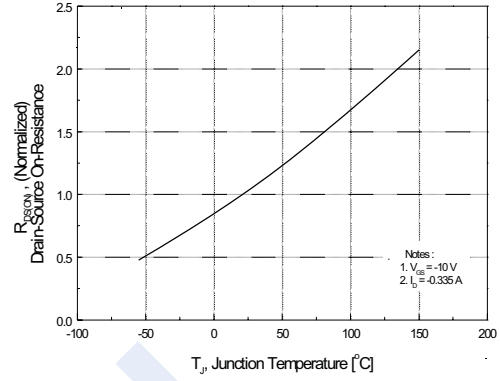


Figure 8. On-Resistance Variation vs. Temperature

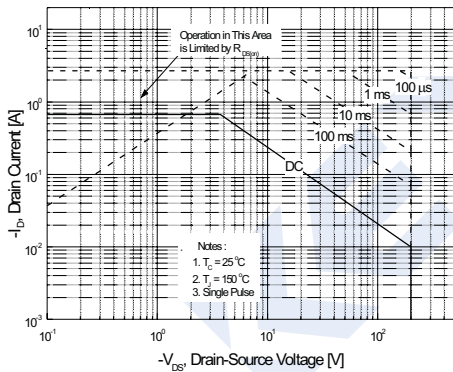


Figure 9. Maximum Safe Operating Area

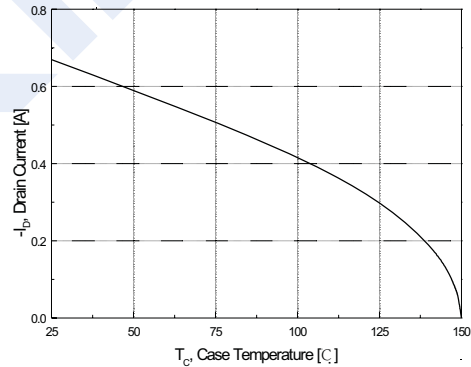


Figure 10. Maximum Drain Current vs. Case Temperature

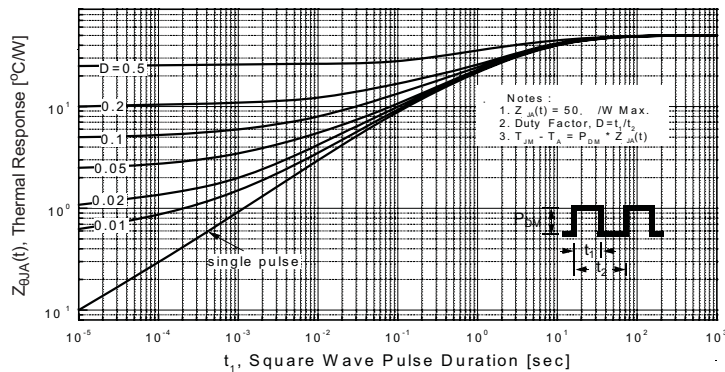
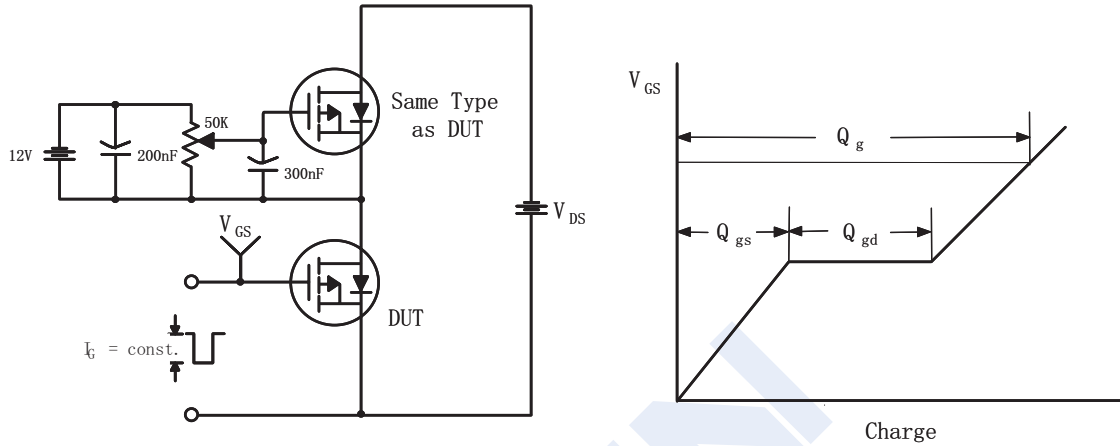


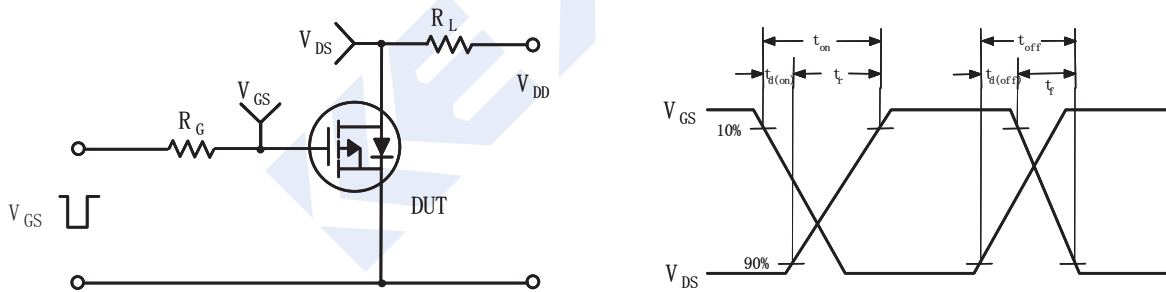
Figure 11. Transient Thermal Response Curve

## P-Channel MOSFET 2SJ3001

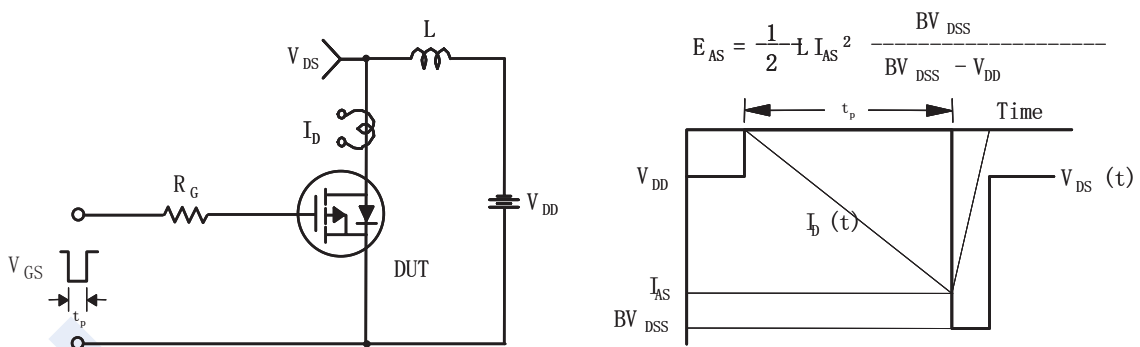
**Figure 12. Gate Charge Test Circuit & Waveform**



**Figure 13. Resistive Switching Test Circuit & Waveforms**



**Figure 14. Unclamped Inductive Switching Test Circuit & Waveforms**



## P-Channel MOSFET

### 2SJ3001

Figure 15. Peak Diode Recovery  $dv/dt$  Test Circuit & Waveforms

