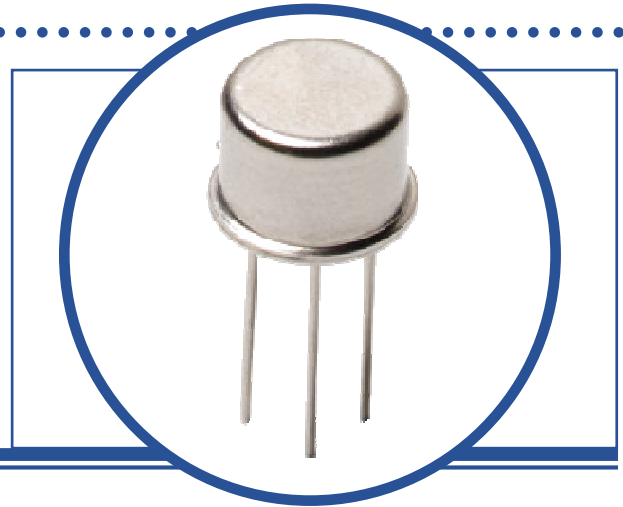


# P-CHANNEL POWER MOSFET

## 2N6851

- Hermetic TO39 Metal Package
- Dynamic dv/dt Rating
- Simple Drive Requirements
- Screening Options Available



### ABSOLUTE MAXIMUM RATINGS (T<sub>case</sub> = 25°C unless otherwise stated)

V <sub>DS</sub>	Drain – Source Voltage	-200V
V <sub>GS</sub>	Gate – Source Voltage	±20V
I <sub>D</sub>	Continuous Drain Current @ T <sub>case</sub> = 25°C	-4.0A
I <sub>D</sub>	Continuous Drain Current @ T <sub>case</sub> = 100°C	-2.4A
I <sub>DM</sub> <sup>(1)</sup>	Pulsed Drain Current	-16A
P <sub>D</sub>	Total Power Dissipation @ T <sub>case</sub> = 25°C	25W
	Linear De-rating Factor @ T <sub>case</sub> ≥ 25°C	200mW/°C
dv/dt <sup>(2)</sup>	Peak Diode Recovery dv/dt	-5V/ns
T <sub>J</sub>	Operating Temperature Range	-55°C to +150°C
T <sub>stg</sub>	Storage Temperature Range	-55°C to +150°C

### THERMAL CHARACTERISTICS

Symbol	Parameters	Max	Units
R <sub>θJC</sub>	Thermal Resistance, Junction To Case	5	°C/W

#### Notes:

- 1) Repetitive Rating; Pulse width limited by maximum junction temperature
- 2) I<sub>SD</sub> ≤ -4.0A, di/dt ≤ -120A/μs, V<sub>DD</sub> ≤ -200V, T<sub>J</sub> ≤ 150°C
- 3) Pulse width ≤ 380 μs; Duty Cycle ≤ 2%
- 4) By design. Not a production test.

# P-CHANNEL POWER MOSFET 2N6851

## ELECTRICAL CHARACTERISTICS ( $T_{\text{case}} = 25^{\circ}\text{C}$ unless otherwise stated)

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units
$BV_{\text{DSS}}$	Drain-Source Breakdown Voltage	$V_{\text{GS}} = 0$ $I_{\text{D}} = -1.0\text{mA}$	-200			V
$\frac{\Delta BV_{\text{DSS}}}{\Delta T_{\text{j}}}$	Temperature Coefficient of Breakdown Voltage	Reference to $25^{\circ}\text{C}$ $I_{\text{D}} = -1.0\text{mA}$		-0.22		$\text{V}/^{\circ}\text{C}$
$R_{\text{DS(on)}}^{(3)}$	Static Drain-Source On-State Resistance	$V_{\text{GS}} = -10\text{V}$ $I_{\text{D}} = -2.4\text{A}$			0.80	$\Omega$
		$V_{\text{GS}} = -10\text{V}$ $I_{\text{D}} = -4.0\text{A}$			0.83	
		$T_{\text{j}} = 125^{\circ}\text{C}$			1.60	
$V_{\text{GS(th)}}$	Gate Threshold Voltage	$V_{\text{DS}} \geq V_{\text{GS}}$ $I_{\text{D}} = -250\mu\text{A}$	-2.0		-4.0	V
		$T_{\text{j}} = 125^{\circ}\text{C}$	-1.0			
		$T_{\text{j}} = -55^{\circ}\text{C}$			-5.0	
$g_{\text{fs}}^{(3)}$	Forward Transconductance	$V_{\text{DS}} \geq -15\text{V}$ $I_{\text{DS}} = -2.4\text{A}$	2.2			$\text{S}(\Omega)$
$I_{\text{DSS}}$	Zero Gate Voltage Drain Current	$V_{\text{GS}} = 0$ $V_{\text{DS}} = 0.8BV_{\text{DSS}}$			-25	$\mu\text{A}$
		$T_{\text{j}} = 125^{\circ}\text{C}$			-250	
$I_{\text{GSS}}$	Gate-Source Leakage	$V_{\text{GS}} = \pm 20\text{V}$			$\pm 100$	nA
		$T_{\text{j}} = 125^{\circ}\text{C}$			$\pm 200$	

## DYNAMIC CHARACTERISTICS

$C_{\text{iss}}$	Input Capacitance	$V_{\text{GS}} = 0$		700		pF
$C_{\text{oss}}$	Output Capacitance	$V_{\text{DS}} = -25\text{V}$		200		
$C_{\text{rss}}$	Reverse Transfer Capacitance	$f = 1.0\text{MHz}$		40		
$Q_{\text{g}}^{(4)}$	Total Gate Charge	$V_{\text{GS}} = -10\text{V}$	14.7		34.8	nC
$Q_{\text{gs}}^{(4)}$	Gate-Source Charge	$I_{\text{D}} = -4.0\text{A}$	0.8		7.0	
$Q_{\text{gd}}^{(4)}$	Gate-Drain Charge	$V_{\text{DS}} = 0.5BV_{\text{DSS}}$	5.0		17	
$t_{\text{d(on)}}$	Turn-On Delay Time	$V_{\text{DD}} = -100\text{V}$		50		ns
$t_{\text{r}}$	Rise Time	$I_{\text{D}} = -4.0\text{A}$		100		
$t_{\text{d(off)}}$	Turn-Off Delay Time	$R_{\text{G}} = 7.5\Omega$		100		
$t_{\text{f}}$	Fall Time	$V_{\text{GS}} = -10\text{V}$		80		

## SOURCE – DRAIN DIODE CHARACTERISTICS

$I_{\text{S}}$	Continuous Source Current				-4.0	A
$I_{\text{SM}}$	Pulse Source Current				-16	
$V_{\text{SD}}^{(3)}$	Diode Forward Voltage	$I_{\text{S}} = -4.0\text{A}$ $V_{\text{GS}} = 0$			-6.0	V
$t_{\text{rr}}^{(3)}$	Reverse Recovery Time	$I_{\text{F}} = -4.0\text{A}$ $V_{\text{DD}} \leq -50\text{V}$			400	ns
$Q_{\text{rr}}^{(3),(4)}$	Reverse Recovery Charge	$di/dt \leq -100\text{A}/\mu\text{s}$			4.0	$\mu\text{C}$
$t_{\text{on}}$	Forward Turn - on Time		Negligible			

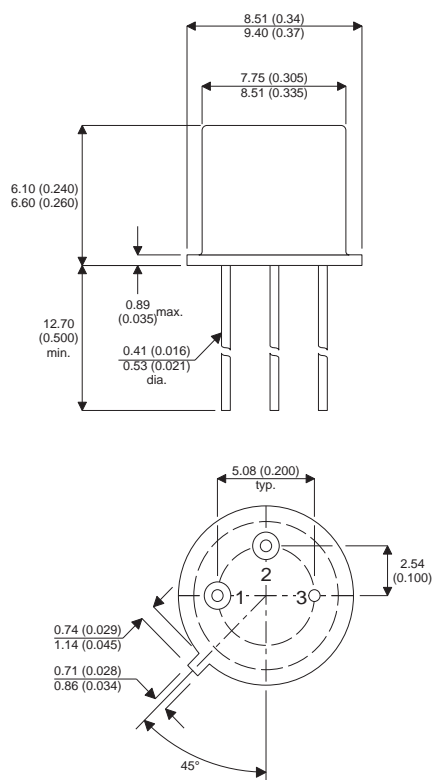
## PACKAGE CHARACTERISTICS

$L_{\text{D}}$	Internal Drain Inductance			5.0		nH
$L_{\text{S}}$	Internal Source Inductance			15		

# P-CHANNEL POWER MOSFET 2N6851

## MECHANICAL DATA

Dimensions in mm (inches)



### TO-39 (TO-205AD) METAL PACKAGE Underside View

Pin 1 - Source

Pin 2 - Gate

Pin 3 - Drain