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2SK2089

HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS.

CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS.

- Low Drain-Source ON Resistance : $R_{DS(ON)}=1.8\Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}|=3.0S$ (Typ.)
- Low Leakage Current : $I_{DSS}=300\mu A$ (Max.) ($V_{DS}=640V$)
- Enhancement-Mode : $V_{th}=1.5\sim 3.5V$ ($V_{DS}=10V$, $I_D=1mA$)

MAXIMUM RATINGS ($T_a=25^\circ C$)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Drain-Source Voltage	V_{DSS}	800	V
Drain-Gate Voltage ($R_{GS}=20k\Omega$)	V_{DGR}	800	V
Gate-Source Voltage	V_{GSS}	± 30	V
Drain Current	DC	I_D	5
	Pulse	I_{DP}	15
Drain Power Dissipation ($T_c=25^\circ C$)	P_D	100	W
Channel Temperature	T_{ch}	150	$^\circ C$
Storage Temperature Range	T_{stg}	$-55\sim 150$	$^\circ C$

THERMAL CHARACTERISTICS

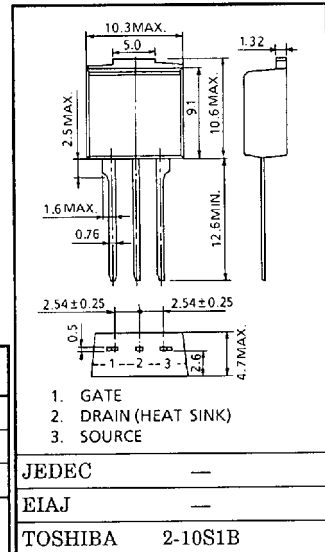
CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Case	$R_{th(ch-c)}$	1.25	$^\circ C/W$
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	83.3	$^\circ C/W$

THIS TRANSISTOR IS AN ELECTROSTATIC SENSITIVE DEVICE.
PLEASE HANDLE WITH CAUTION.

INDUSTRIAL APPLICATIONS

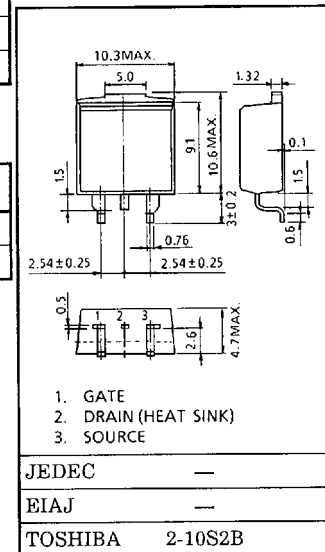
TO-220FL

Unit in mm



TO-220SM

Unit in mm



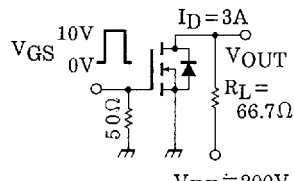
Weight : 1.5g

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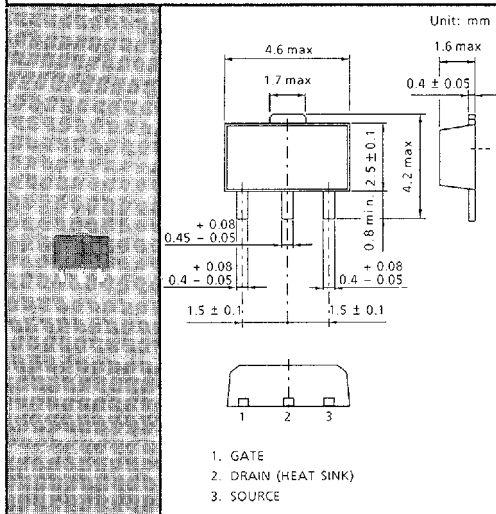
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I_{GSS}	$V_{GS} = \pm 30V, V_{DS} = 0V$	—	—	± 100	nA
Drain Cut-off Current		I_{DSS}	$V_{DS} = 640V, V_{GS} = 0V$	—	—	300	μA
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	$I_D = 10mA, V_{GS} = 0V$	800	—	—	V
Gate Threshold Voltage		V_{th}	$V_{DS} = 10V, I_D = 1mA$	1.5	—	3.5	V
Drain-Source ON Resistance		$R_{DS(ON)}$	$V_{GS} = 10V, I_D = 3A$	—	1.8	2.4	Ω
Forward Transfer Admittance		$ Y_{fs} $	$V_{DS} = 20V, I_D = 3A$	1.0	3.0	—	S
Input Capacitance		C_{iss}	$V_{DS} = 25V, V_{GS} = 0V,$ $f = 1MHz$	—	610	—	pF
Reverse Transfer Capacitance		C_{rss}		—	60	—	
Output Capacitance		C_{oss}		—	110	—	
Switching Time	Rise Time	t_r	 <p>$I_D = 3A$ $V_{GS} \begin{matrix} 10V \\ 0V \end{matrix}$ 50Ω $R_L = 66.7\Omega$ $V_{DD} = 200V$</p>	—	30	—	ns
	Turn-on Time	t_{on}		—	70	—	
	Fall Time	t_f		—	35	—	
	Turn-off Time	t_{off}		$V_{IN} : t_r, t_f < 5ns,$ $Duty \leq 1\%, t_w = 10\mu s$	—	165	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Q_g	$V_{DD} = 400V, V_{GS} = 10V,$ $I_D = 5A$	—	47	—	nC
Gate-Source Charge		Q_{gs}		—	19	—	
Gate-Drain ("Miller") Charge		Q_{gd}		—	28	—	

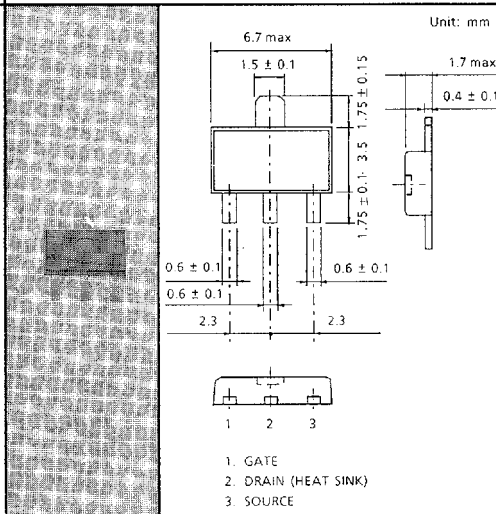
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	I_{DR}	—	—	—	5	A
Pulse Drain Reverse Current	I_{DRP}	—	—	—	15	A
Diode Forward Voltage	V_{DSF}	$I_{DR} = 5A, V_{GS} = 0V$	—	—	-1.9	V
Reverse Recovery Time	t_{rr}	$I_{DR} = 5A, V_{GS} = 0V$	—	1450	—	ns
Reverse Recovered Charge	Q_{rr}	$dI_{DR} / dt = 100A / \mu s$	—	—	—	nC

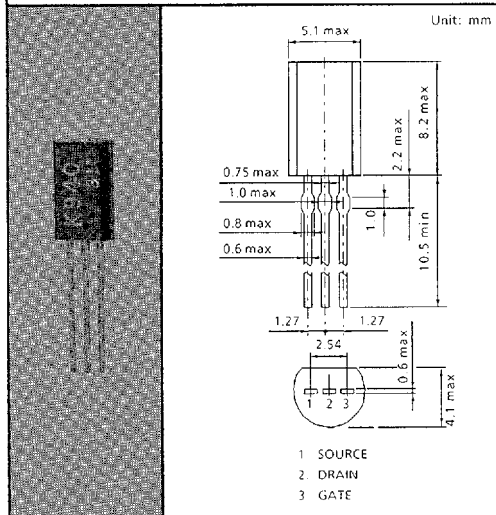
POWER-MINI (SOT-89)



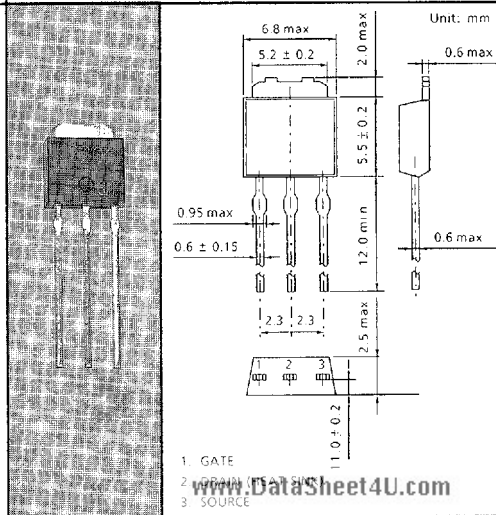
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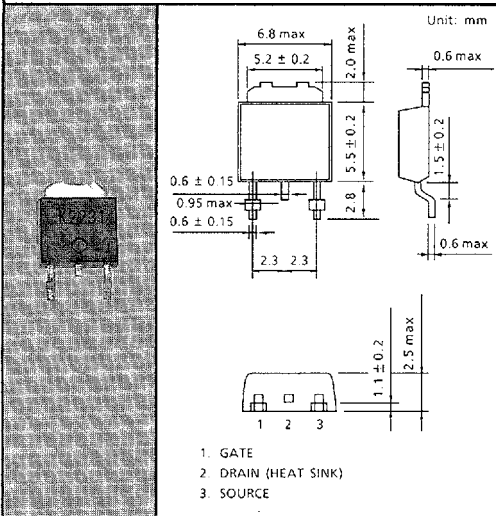
TO92-MOD



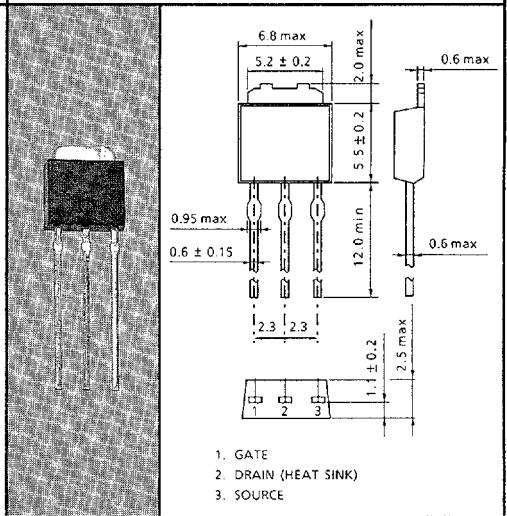
POWER-MOLD (Straight)



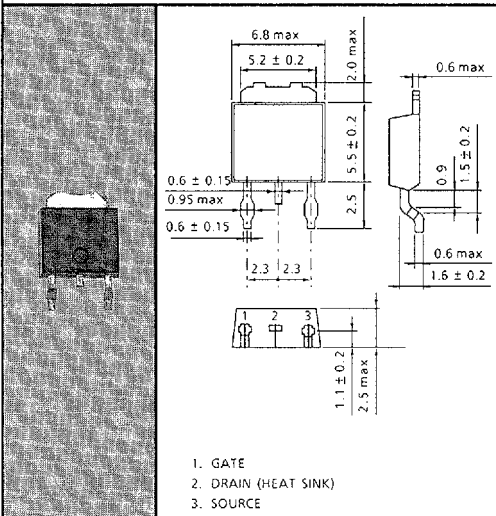
POWER-MOLD (Lead Formed)



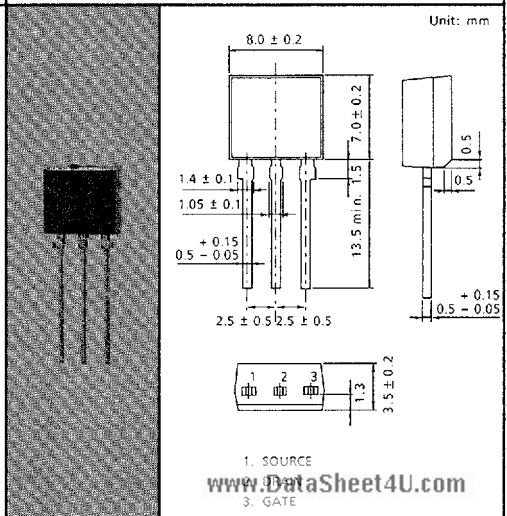
DP (Straight)



DP (Lead Forming)

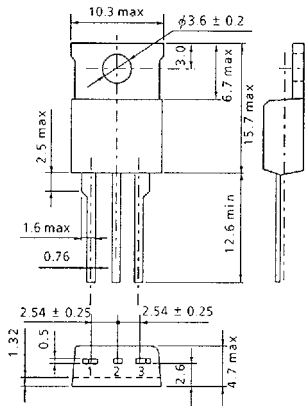


TPS



TO-220AB

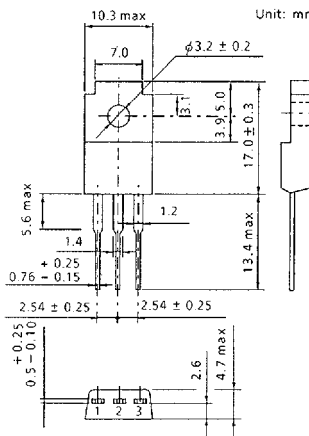
Unit: mm



1. GATE
2. DRAIN (HEAT SINK)
3. SOURCE

TO-220 (IS)

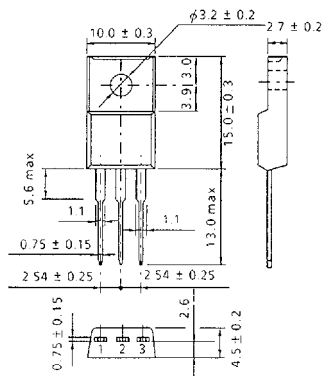
Unit: mm



1. GATE
2. DRAIN
3. SOURCE

TO-220 (NIS)

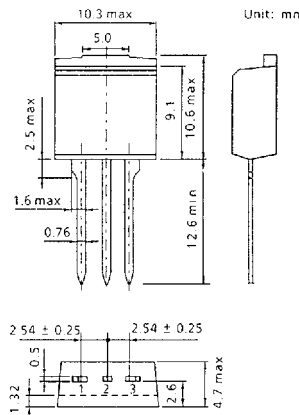
Unit: mm



1. GATE
2. DRAIN
3. SOURCE

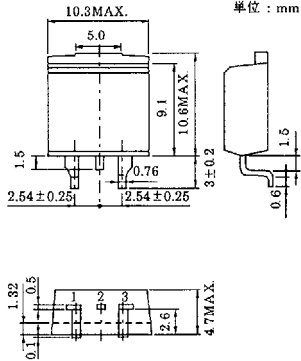
TO-220FL

Unit: mm



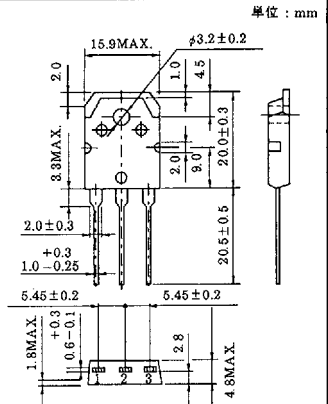
1. GATE
2. DRAIN
3. SOURCE

TO-220SM



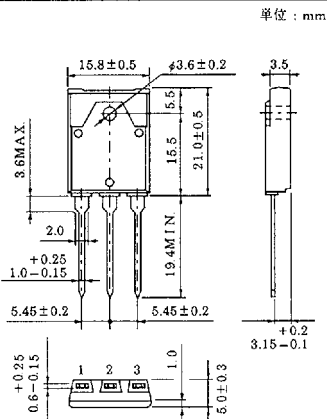
1. GATE
2. DRAIN (HEAT SINK)
3. SOURCE

TO-3P (N)



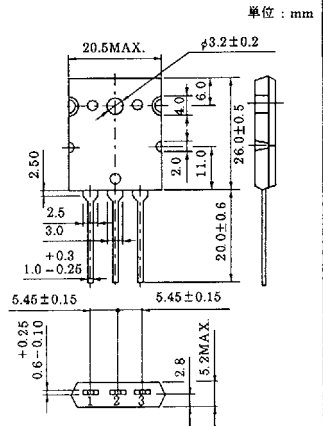
1. GATE
2. DRAIN (HEAT SINK)
3. SOURCE

TO-3P (N) IS



1. GATE
2. DRAIN
3. SOURCE

TO-3P (L)



1. GATE
2. DRAIN (HEAT SINK)