2SK2089

HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS.

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

INDUSTRIAL 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 : $V_{th}=1.5\sim3.5V$ ($V_{DS}=10V$, $I_D=1mA$)

MAXIMUM RATINGS (Ta = 25°C)

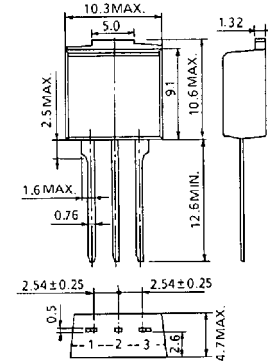
CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DSS}	800	V
Drain-Gate Voltage ($R_{GS}=20k\Omega$)		V_{DGR}	800	V
Gate-Source Voltage		V_{GSS}	±30	V
Drain Current	DC	I_D	5	A
	Pulse	I_{DP}	15	
Drain Power Dissipation (Tc = 25°C)		P_D	100	W
Channel Temperature		T_{ch}	150	°C
Storage Temperature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

THERMAL CHARACTERISTICS

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

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

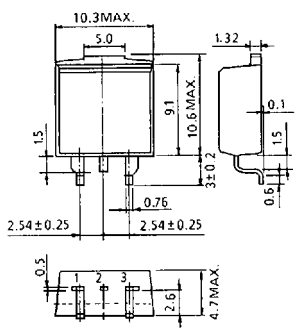
TO-220FL Unit in mm



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

JEDEC	—
EIAJ	—
TOSHIBA	2-10S1B

TO-220SM Unit in mm



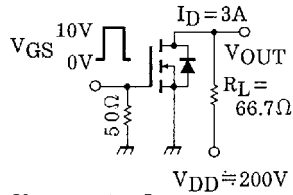
1. GATE
2. DRAIN (HEAT SINK)
3. SOURCE

JEDEC	—
EIAJ	—
TOSHIBA	2-10S2B

Weight : 1.5g

961001EAA2

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

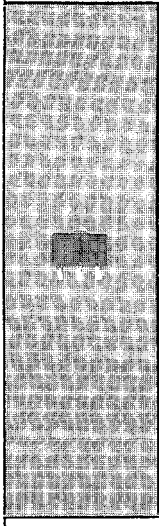
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I_{GSS}	$V_{GS}=\pm30V$, $V_{DS}=0V$	—	—	±100	nA
Drain Cut-off Current		I_{DSS}	$V_{DS}=640V$, $V_{GS}=0V$	—	—	300	μA
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	$I_D=10mA$, $V_{GS}=0V$	800	—	—	V
Gate Threshold Voltage		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		—	30	—	ns
	Turn-on Time	t_{on}		—	70	—	
	Fall Time	t_f		—	35	—	
	Turn-off Time	t_{off}		—	165	—	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Q_g	$V_{DD}\fallingdotseq400V$, $V_{GS}=10V$, $I_D=5A$	—	47	—	nC
Gate-Source Charge		Q_{gs}		—	19	—	
Gate-Drain ("Miller") Charge		Q_{gd}		—	28	—	

V_{IN} : t_r, $t_f<5ns$,
Duty ≦ 1%, $t_w=10\mu s$

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}	$I_{DR}=5A$, $V_{GS}=0V$, $dI_{DR}/dt=100A/\mu s$	—	1450	—	ns
Reverse Recovered Charge	Q_{rr}		—	4.20	—	μC

POWER-MINI (SOT-89)



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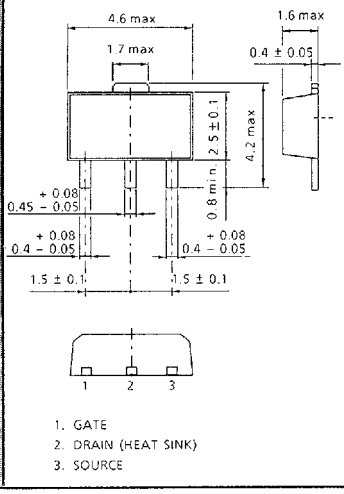
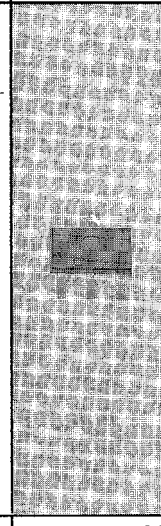


1. GATE
2. DRAIN (HEAT SINK)
3. SOURCE

SP (SOT-223)



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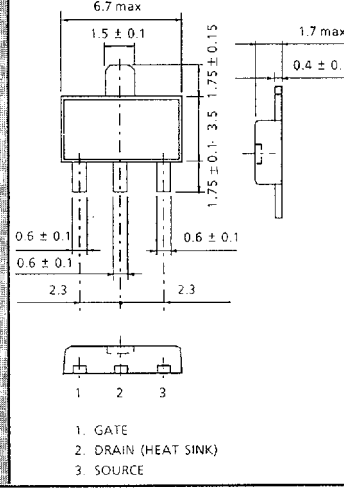
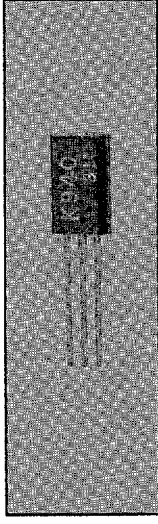


1. GATE
2. DRAIN (HEAT SINK)
3. SOURCE

TO92-MOD



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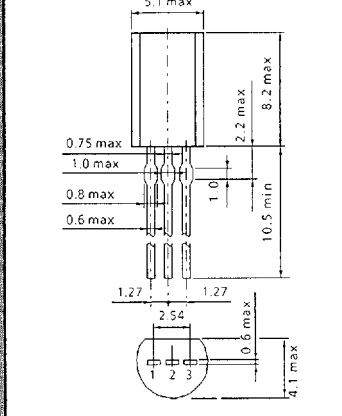
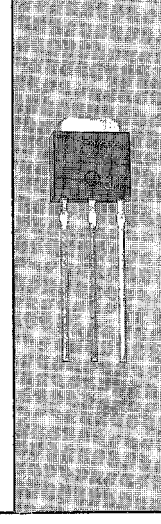


1. SOURCE
2. DRAIN
3. GATE

POWER-MOLD (Straight)



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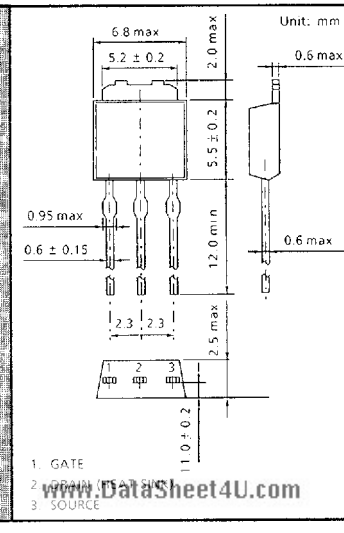
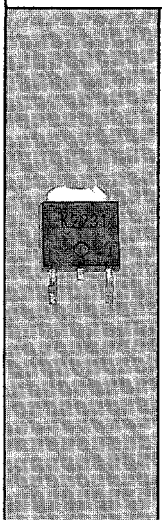


1. GATE
2. DRAIN (HEAT SINK)
3. SOURCE

POWER-MOLD (Lead Formed)



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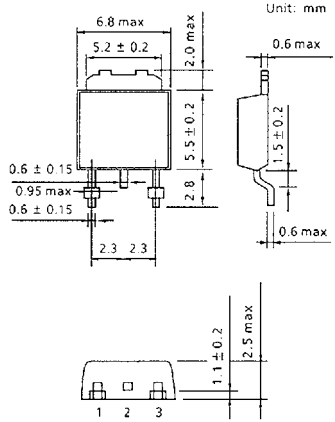
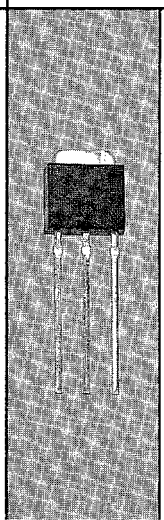
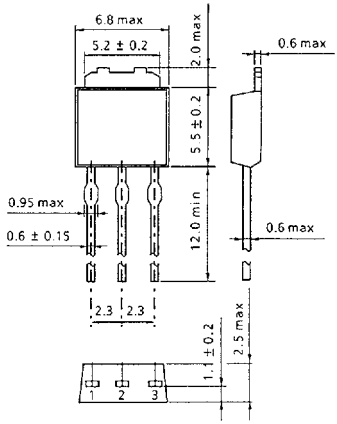


1. GATE
2. DRAIN (HEAT SINK)
3. SOURCE

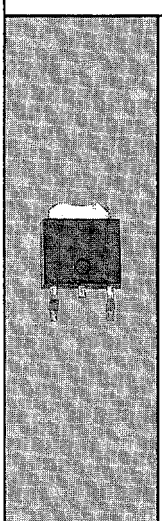
DP (Straight)

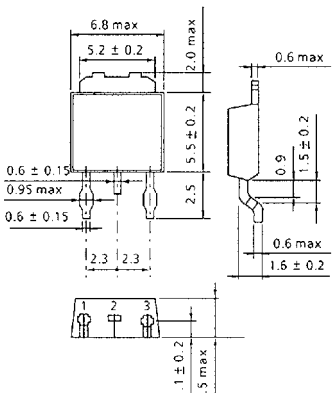




1. GATE
2. DRAIN (HEAT SINK)
3. SOURCE

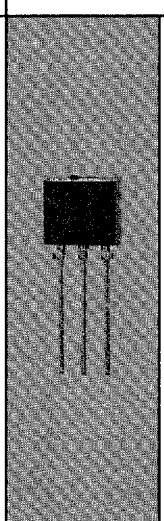
DP (Lead Forming)





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

TPS



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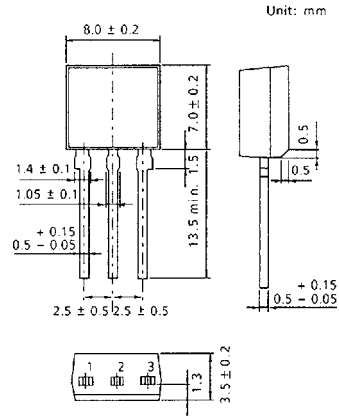
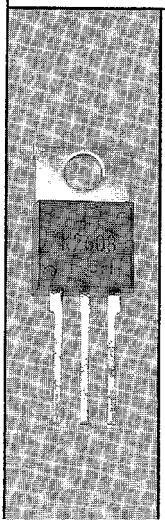


1. SOURCE
2. DRAIN
3. GATE

TO-220AB



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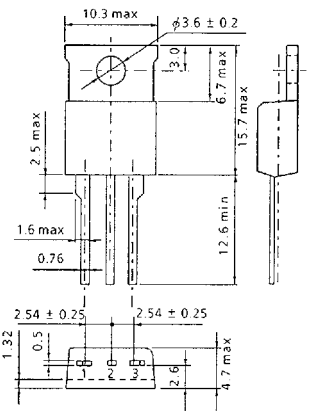
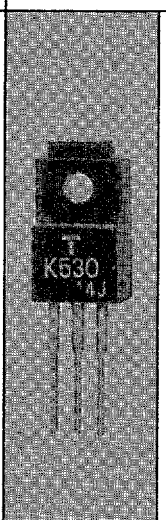
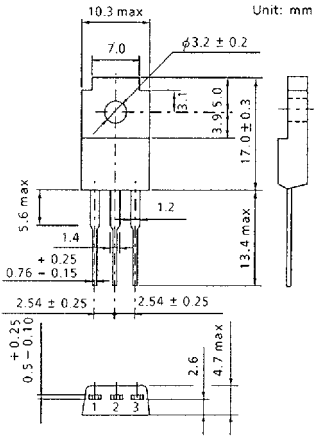


1. GATE
2. DRAIN (HEAT SINK)
3. SOURCE

TO-220 (IS)

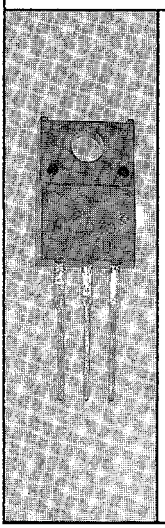


Unit: mm

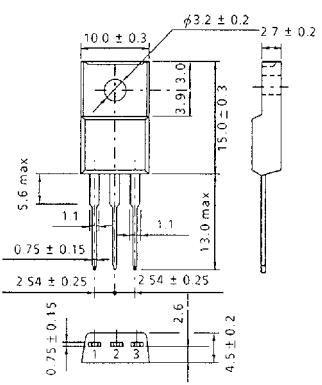


1. GATE
2. DRAIN
3. SOURCE

TO-220 (NIS)

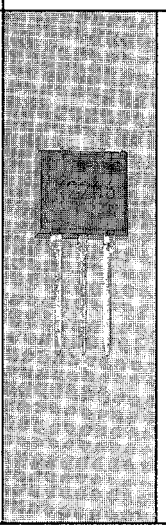


Unit: mm

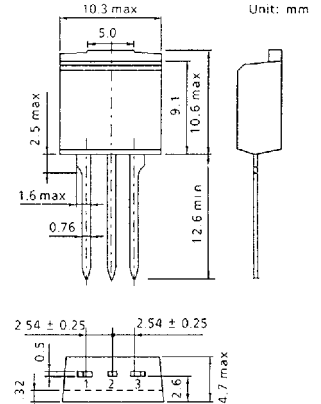


1. GATE
2. DRAIN
3. SOURCE

TO-220FL

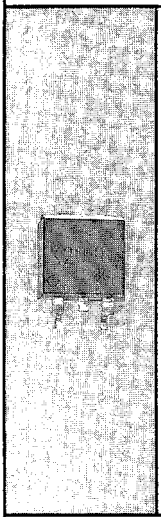


Unit: mm



1. GATE
2. DRAIN
3. SOURCE

TO-220SM



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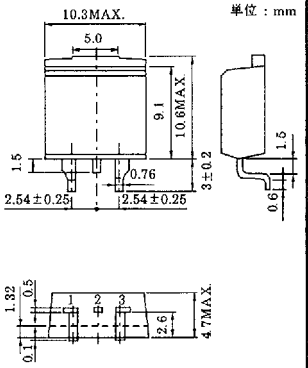
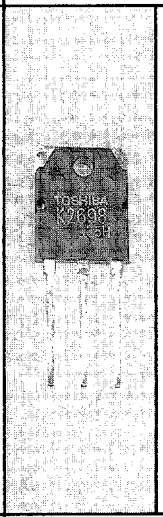


1. GATE
2. DRAIN (HEAT SINK)
3. SOURCE

TO-3P (N)



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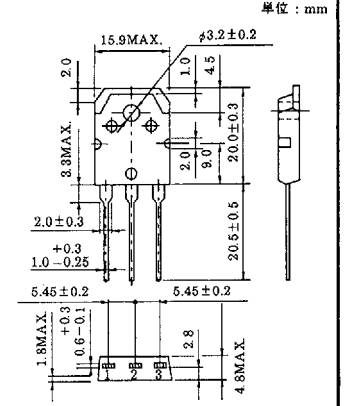
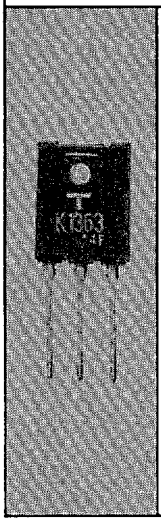


1. GATE
2. DRAIN (HEAT SINK)
3. SOURCE

TO-3P (N) IS



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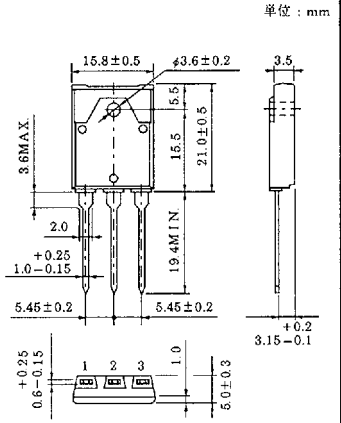
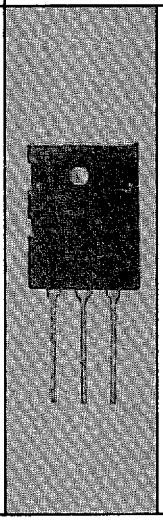


1. GATE
2. DRAIN
3. SOURCE

TO-3P (L)



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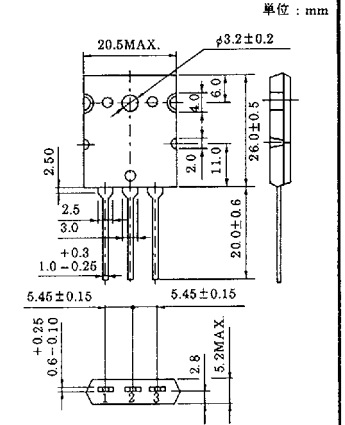

1. GATE
2. DRAIN (HEAT SINK)
3. SOURCE