

TO-220 Plastic Package

CSC2238, CSC2238A, CSC2238B

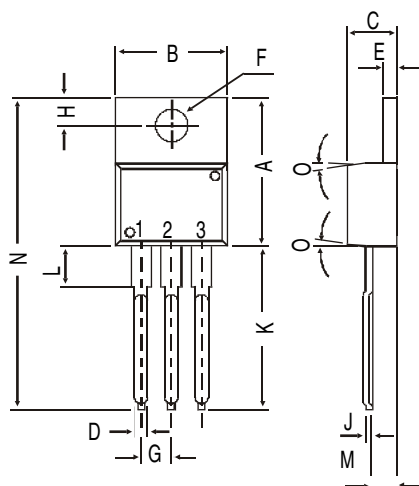
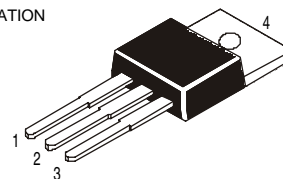
CSC2238, 2238A, 2238B NPN PLASTIC POWER TRANSISTORS

Complementary 2SA968, 968A, 968B

Power Amplifier and Driver Stage Amplifier Applications

PIN CONFIGURATION

1. BASE
2. COLLECTOR
3. EMITTER
4. COLLECTOR



DIM	MIN.	MAX.
A	14.42	16.51
B	9.63	10.67
C	3.56	4.83
D		0.90
E	1.15	1.40
F	3.75	3.88
G	2.29	2.79
H	2.54	3.43
J		0.56
K	12.70	14.73
L	2.80	4.07
M	2.03	2.92
N		31.24
O	DEG 7	

All dimensions in mm.

ABSOLUTE MAXIMUM RATINGS

		2238	2238A	2238B	
Collector-base voltage (open emitter)	V_{CBO}	max. 160	180	200	V
Collector-emitter voltage (open base)	V_{CEO}	max. 160	180	200	V
Collector current	I_C	max.	1.5		A
Total power dissipation up to $T_C = 25^\circ\text{C}$	P_{tot}	max.	25		W
Junction temperature	T_j	max.	150		$^\circ\text{C}$
Collector-emitter saturation voltage					
$I_C = 500 \text{ mA}; I_B = 50 \text{ mA}$	V_{CEsat}	max.	1.5		V
D.C. current gain					
$I_C = 100 \text{ mA}; V_{CE} = 5 \text{ V}$	h_{FE}	min	70		
		max.	240		

RATINGS (at $T_A=25^\circ\text{C}$ unless otherwise specified)

Limiting values		2238	2238A	2238B	
Collector-base voltage (open emitter)	V_{CBO}	max. 160	180	200	V
Collector-emitter voltage (open base)	V_{CEO}	max. 160	180	200	V
Emitter-base voltage (open collector)	V_{EBO}	max.	5.0		V
Collector current	I_C	max.	1.5		A

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Emitter current	I_E	max.	-1.5	A
Total power dissipation up to $T_C = 25^\circ\text{C}$	P_{tot}	max.	25	W
Junction temperature	T_j	max.	150	$^\circ\text{C}$
Storage temperature	T_{stg}		-65 to +150	$^\circ\text{C}$

CHARACTERISTICS

$T_{\text{amb}} = 25^\circ\text{C}$ unless otherwise specified

			2238	2238A	2238B
Collector cutoff current					
$I_E = 0; V_{CB} = 160$	I_{CBO}	max.		1.0	μA
Emitter cut-off current					
$I_C = 0; V_{EB} = 5\text{V}$	I_{EBO}	max.		1.0	μA
Breakdown voltages					
$I_C = 10\text{ mA}; I_B = 0$	V_{CEO}	min.	160	180	200 V
$I_C = 1\text{ mA}; I_E = 0$	V_{CBO}	min.	160	180	200 V
$I_E = 1\text{ mA}; I_C = 0$	V_{EBO}	min.		5.0	V
Saturation voltage					
$I_C = 500\text{ mA}; I_B = 50\text{ mA}$	$V_{CE\text{sat}}$	max.		1.5	V
Base emitter on voltage					
$I_C = 500\text{ mA}; V_{CE} = 5\text{ V}$	$V_{BE(\text{on})}$	max.		1.0	V
D.C. current gain					
$I_C = 100\text{ mA}; V_{CE} = 5\text{ V}^{**}$	h_{FE}	min.		70	
		max.		240	
Output capacitance at $f = 1\text{ MHz}$					
$I_E = 0; V_{CB} = 10\text{ V}$	C_o	typ.		25	pF
Transition frequency					
$I_C = 100\text{ mA}; V_{CE} = 10\text{ V}$	f_T	typ.		100	MHz

**** h_{FE} classification: O: 70-140 Y: 120-240**

Customer Notes

Disclaimer

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