

High Voltage Fast-Switching NPN Power Transistor

FEATURES

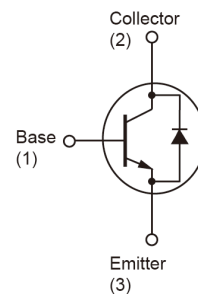
- High Voltage Capability
- Fast Switching Speed
- Pb-free plating
- RoHS compliant
- Halogen-free mold compound

APPLICATION

- Electronic Ballast
- Switch mode power supply

KEY PERFORMANCE PARAMETERS

PARAMETER		VALUE	UNIT
BV_{CEO}		450	V
BV_{CBO}		1050	V
I_C		5	A
$V_{CE(SAT)}$	$I_C=1A, I_B=0.2A$	0.5	V



Notes: Moisture sensitivity level: level 3. Per J-STD-020

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

PARAMETER	SYMBOL	LIMIT	UNIT
Collector-Base Voltage	V_{CBO}	1050	V
Collector-Emitter Voltage @ $V_{BE}=0V$	V_{CES}	450	V
Emitter-Base Voltage	V_{EBO}	15	V
Collector Current	I_C	5	A
Collector Peak Current ($t_p < 5ms$)	I_{CM}	8	A
Base Current	I_B	2	A
Base Peak Current ($t_p < 5ms$)	I_{BM}	4	A
Power Total Dissipation @ $T_C=25^\circ\text{C}$	P_{DTOT}	45	W
Maximum Operating Junction Temperature	T_J	+150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 to +150	$^\circ\text{C}$

THERMAL PERFORMANCE

PARAMETER	SYMBOL	LIMIT	UNIT
Junction to Case Thermal Resistance	$R_{\theta JC}$	2.78	$^\circ\text{C/W}$
Junction to Ambient Thermal Resistance	$R_{\theta JA}$	100	$^\circ\text{C/W}$

ELECTRICAL SPECIFICATIONS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNIT
Collector-Base Voltage	$I_C = 0.5\text{mA}$	BV_{CBO}	1050	--	--	V
Collector-Emitter Breakdown Voltage	$I_C = 5\text{mA}$	BV_{CEO}	450	--	--	V
Emitter-Base Breakdown Voltage	$I_E = 1\text{mA}$	BV_{EBO}	15	--	--	V
Collector Cutoff Current	$V_{CE} = 400\text{V}, I_B = 0$	I_{CEO}	--	10	250	μA
Collector Cutoff Current	$V_{CB} = 950\text{V}, I_E = 0$	I_{CBO}	--	--	10	μA
Collector-Emitter Saturation Voltage	$I_C = 1\text{A}, I_B = 0.2\text{A}$	$V_{CE(SAT)1}$	---	--	0.5	V
Collector-Emitter Saturation Voltage	$I_C = 3.5\text{A}, I_B = 1\text{A}$	$V_{CE(SAT)2}$	---	1.5	2.0	V
Base-Emitter Saturation Voltage	$I_C = 3.5\text{A}, I_B = 1\text{A}$	$V_{BE(SAT)1}$	--	1.1	1.5	V
DC Current Gain	$V_{CE} = 5\text{V}, I_C = 0.1\text{A}$	h_{FE1}	50	70	100	
	$V_{CE} = 3\text{V}, I_C = 0.8\text{A}$	h_{FE2}	25	30	50	
Diode Forward Voltage	$I_C = 2\text{A}$	V_F	--	--	1.5	V
Rise Time ^(Note 2)	$V_{CC} = 5\text{V}, I_C = 0.5\text{A}$	t_r	--	--	1	μs
Storage Time ^(Note 2)		t_{STG}	4.5	5	5.5	μs
Fall Time ^(Note 2)		t_f	--	--	1.2	μs
Repetitive Avalanche Energy	$L = 2\text{mH}$	E_{AR}	6	--	--	mJ

Notes:

1. Pulse test: $\leq 380\mu\text{s}$, duty cycle $\leq 2\%$
2. For DESIGN AID ONLY, not subject to production testing.

ORDERING INFORMATION

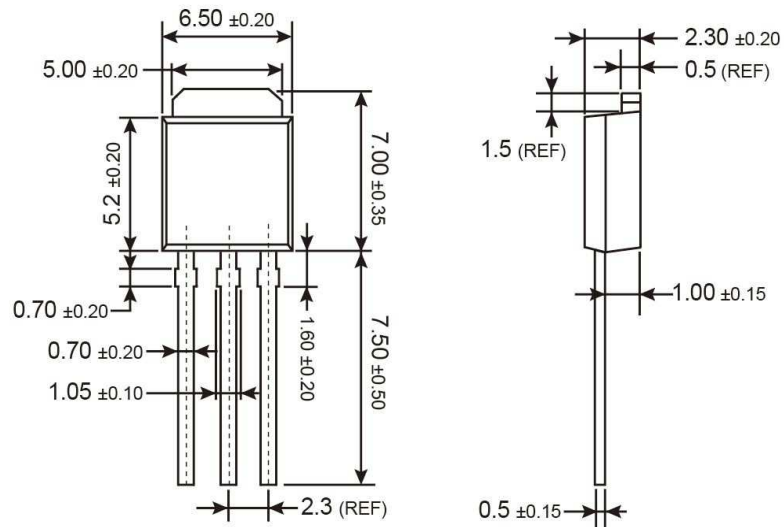
PART NO.	PACKAGE	PACKING
TSC5804DCH C5G	TO-251	75pcs / Tube
TSC5804DCP ROG	TO-252	2,500pcs / 13" Reel

Note:

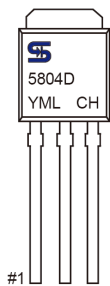
1. Compliant to RoHS Directive 2011/65/EU and in accordance to WEEE 2002/96/EC
2. Halogen-free according to IEC 61249-2-21 definition

PACKAGE OUTLINE DIMENSIONS (Unit: Millimeters)

TO-251 (IPAK)



Marking Diagram



Y = Year Code

M = Month Code for Halogen Free Product

O =Jan **P** =Feb **Q** =Mar **R** =Apr

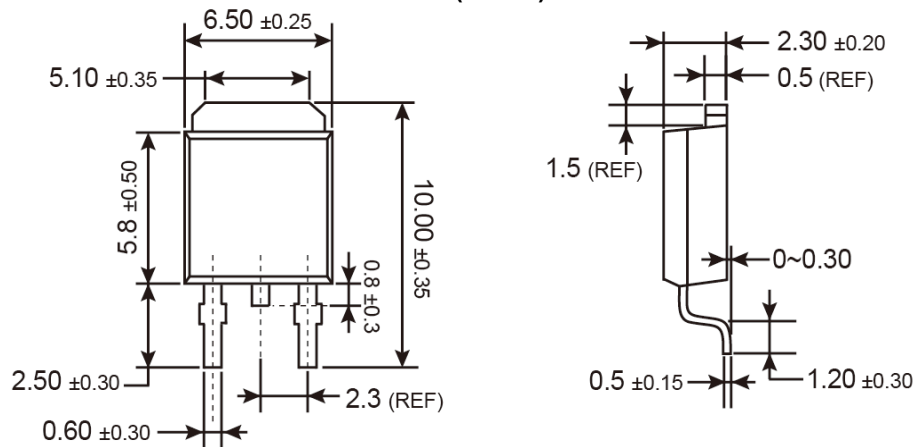
S =May **T** =Jun **U** =Jul **V** =Aug

W =Sep **X** =Oct **Y** =Nov **Z** =Dec

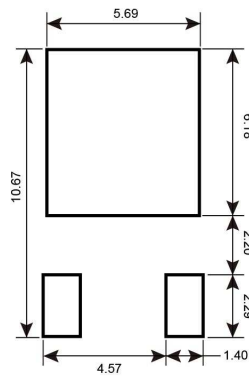
L = Lot Code (1~9, A~Z)

PACKAGE OUTLINE DIMENSIONS (Unit: Millimeters)

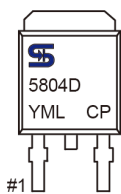
TO-252 (DPAK)



SUGGESTED PAD LAYOUT



MARKING DIAGRAM



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