

## High Voltage Fast-Switching NPN Power Transistor

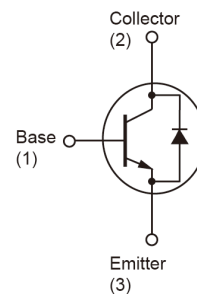
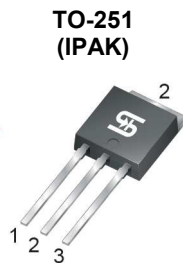
### FEATURES

- 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 <sub>CEO</sub>		450	V
BV <sub>CBO</sub>		1050	V
I <sub>C</sub>		5	A
V <sub>CE(SAT)</sub>	I <sub>C</sub> =1A, I <sub>B</sub> =0.2A	0.5	V



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

ABSOLUTE MAXIMUM RATINGS (T <sub>A</sub> = 25°C unless otherwise noted)			
PARAMETER	SYMBOL	LIMIT	UNIT
Collector-Base Voltage	V <sub>CBO</sub>	1050	V
Collector-Emitter Voltage @ V <sub>BE</sub> =0V	V <sub>CES</sub>	450	V
Emitter-Base Voltage	V <sub>EBO</sub>	15	V
Collector Current	I <sub>C</sub>	5	A
Collector Peak Current (tp <5ms)	I <sub>CM</sub>	8	A
Base Current	I <sub>B</sub>	2	A
Base Peak Current (tp <5ms)	I <sub>BM</sub>	4	A
Power Total Dissipation @ T <sub>C</sub> =25°C	P <sub>DTOT</sub>	45	W
Maximum Operating Junction Temperature	T <sub>J</sub>	+150	°C
Storage Temperature Range	T <sub>STG</sub>	-55 to +150	°C

THERMAL PERFORMANCE			
PARAMETER	SYMBOL	LIMIT	UNIT
Junction to Case Thermal Resistance	R <sub>θJC</sub>	2.78	°C/W
Junction to Ambient Thermal Resistance	R <sub>θJA</sub>	100	°C/W

<b>ELECTRICAL SPECIFICATIONS</b> ( $T_A = 25^\circ\text{C}$ unless otherwise noted)						
<b>PARAMETER</b>	<b>CONDITIONS</b>	<b>SYMBOL</b>	<b>MIN</b>	<b>TYP</b>	<b>MAX</b>	<b>UNIT</b>
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	$\mu\text{A}$
Collector Cutoff Current	$V_{CB} = 950\text{V}, I_E = 0$	$I_{CBO}$	--	--	10	$\mu\text{A}$
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 <sup>(Note 2)</sup>	$V_{CC} = 5\text{V}, I_C = 0.5\text{A}$	$t_r$	--	--	1	$\mu\text{s}$
Storage Time <sup>(Note 2)</sup>		$t_{STG}$	4.5	5	5.5	$\mu\text{s}$
Fall Time <sup>(Note 2)</sup>		$t_f$	--	--	1.2	$\mu\text{s}$
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**

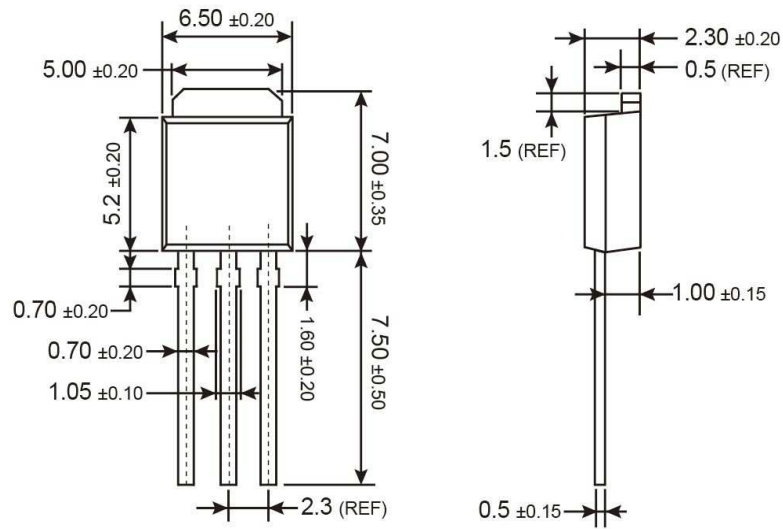
<b>PART NO.</b>	<b>PACKAGE</b>	<b>PACKING</b>
TSC5804DCH C5G	TO-251	75pcs / Tube
TSC5804DCP ROG	TO-252	2,500pcs / 13" Reel

**Note:**

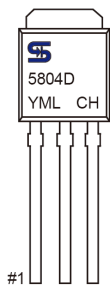
1. Compliant to RoHS Directive 2011/65/EU and in accordance to WEEE 2002/96/EC
2. Halogen-free according to IEC 61249-2-21 definition

**PACKAGE OUTLINE DIMENSIONS** (Unit: Millimeters)

**TO-251 (IPAK)**

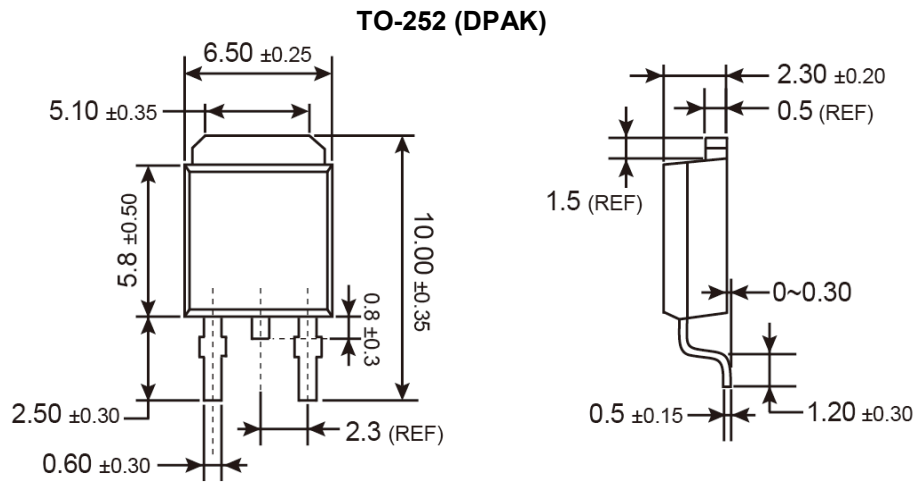


**Marking Diagram**

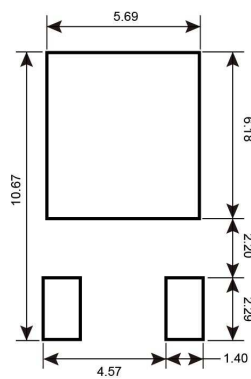


- Y** = Year Code
- M** = Month Code for Halogen Free Product
  - O** =Jan    **P** =Feb    **Q** =Mar    **R** =Apr
  - S** =May    **T** =Jun    **U** =Jul    **V** =Aug
  - W** =Sep    **X** =Oct    **Y** =Nov    **Z** =Dec
- L** = Lot Code (1~9, A~Z)

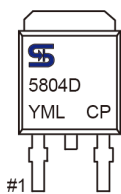
**PACKAGE OUTLINE DIMENSIONS** (Unit: Millimeters)



**SUGGESTED PAD LAYOUT**



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