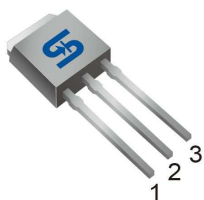


TO-251  
(IPAK)



TO-252  
(DPAK)



**Pin Definition:**

1. Gate
2. Drain
3. Source

**PRODUCT SUMMARY**

$V_{DS}$ (V)	$R_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
500	0.85 @ $V_{GS}=10V$	7.2

**Features**

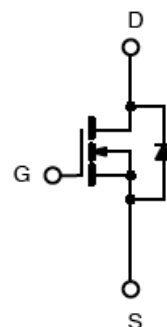
- Low On-Resistance.
- High power and current handling capability.

**Ordering Information**

Part No.	Package	Packing
TSM8N50CH C5G	TO-251	75pcs / Tube
TSM8N50CP ROG	TO-252	2.5Kpcs / 13" Reel

**Note:** "G" denotes for Halogen Free

**Block Diagram**



N-Channel MOSFET

**Absolute Maximum Rating** ( $T_C = 25^\circ C$  unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	$V_{DS}$	500	V
Gate-Source Voltage	$V_{GS}$	$\pm 30$	V
Continuous Drain Current	$I_D$	$T_C = 25^\circ C$	7.2
		$T_C = 100^\circ C$	4.3
Pulsed Drain Current <sup>(Note 1)</sup>	$I_{DM}$	28.8	A
Single Pulse Avalanche Energy <sup>(Note 2)</sup>	$E_{AS}$	181	mJ
Total Power Dissipation @ $T_C = 25^\circ C$	$P_{TOT}$	89	W
Operating Junction Temperature	$T_J$	150	$^\circ C$
Storage Temperature Range	$T_{STG}$	-55 to +150	$^\circ C$

**Note1:** Repetitive Rating : Pulse width limited by maximum junction temperature.

**Note2:**  $L=7mH$ ,  $I_{AS} = 8A$ ,  $V_{DD} = 50V$ ,  $V_{DS} = 200V$ , Starting  $T_J = 25^\circ C$

**Thermal Performance**

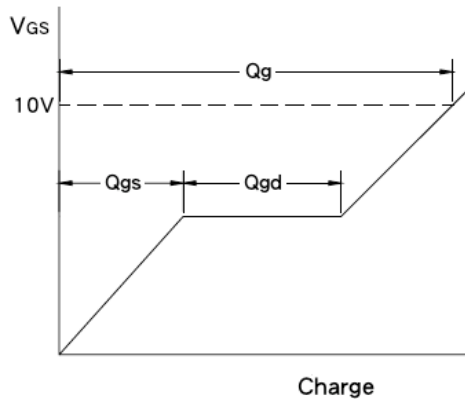
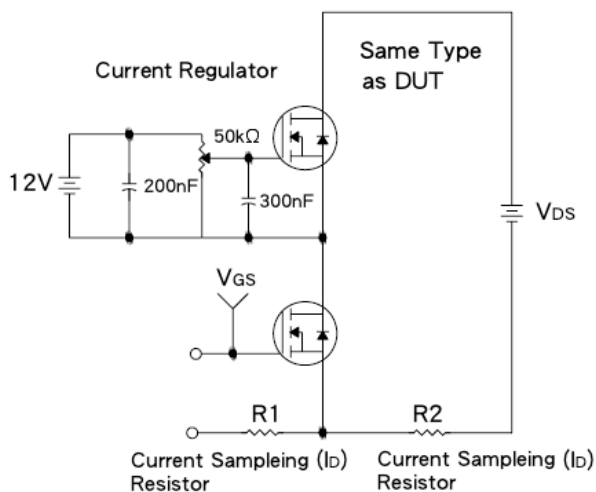
Parameter	Symbol	Limit	Unit
Thermal Resistance - Junction to Case	$R_{\theta_{JC}}$	1.4	$^\circ C/W$
Thermal Resistance - Junction to Ambient	$R_{\theta_{JA}}$	50	

### Electrical Specifications (T<sub>c</sub> = 25°C unless otherwise noted)

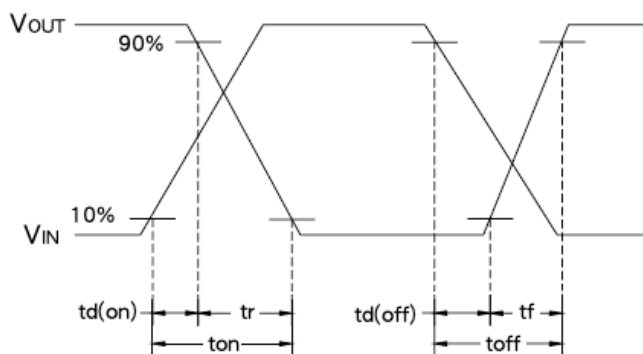
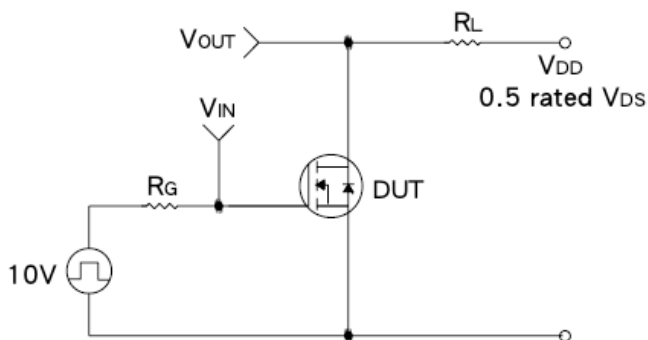
Parameter	Conditions	Symbol	Min	Typ	Max	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250uA	BV <sub>DSS</sub>	500	--	--	V
Drain-Source On-State Resistance	V <sub>GS</sub> = 10V, I <sub>D</sub> = 3.6A	R <sub>DS(ON)</sub>	--	0.7	0.85	Ω
Gate Threshold Voltage	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250uA	V <sub>GS(TH)</sub>	2.0	3.0	4.0	V
Zero Gate Voltage Drain Current	V <sub>DS</sub> = 500V, V <sub>GS</sub> = 0V	I <sub>DSS</sub>	--	--	1	uA
Gate Body Leakage	V <sub>GS</sub> = ±30V, V <sub>DS</sub> = 0V	I <sub>GSS</sub>	--	--	±100	nA
<b>Dynamic</b> (Note a)						
Total Gate Charge	V <sub>DD</sub> = 400V, I <sub>D</sub> = 7A, V <sub>GS</sub> = 10V	Q <sub>g</sub>	--	26.6	--	nC
Gate-Source Charge		Q <sub>gs</sub>	--	5.4	--	
Gate-Drain Charge		Q <sub>gd</sub>	--	6.82	--	
Input Capacitance	V <sub>DS</sub> = 25V, V <sub>GS</sub> = 0V, f = 1.0MHz	C <sub>iss</sub>	--	1595	--	pF
Output Capacitance		C <sub>oss</sub>	--	127.4	--	
Reverse Transfer Capacitance		C <sub>rss</sub>	--	14.5	--	
<b>Switching</b> (Note a)						
Turn-On Delay Time	V <sub>GS</sub> = 10V, I <sub>D</sub> = 7A, V <sub>DD</sub> = 250V, R <sub>GEN</sub> = 9.1Ω	t <sub>d(on)</sub>	--	22	--	nS
Turn-On Rise Time		t <sub>r</sub>	--	6.8	--	
Turn-Off Delay Time		t <sub>d(off)</sub>	--	42	--	
Turn-Off Fall Time		t <sub>f</sub>	--	4.8	--	
<b>Source-Drain Diode Ratings and Characteristic</b>						
Source Current		I <sub>S</sub>	--	--	7	A
Diode Forward Voltage	I <sub>S</sub> = 7A, V <sub>GS</sub> = 0V	V <sub>SD</sub>	--	--	1.5	V

**Note a:** Pulse Test : Pulse Width < 300μs, Duty Cycle < 2%.

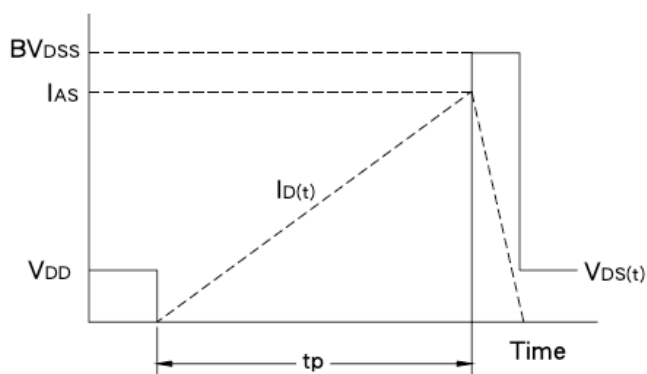
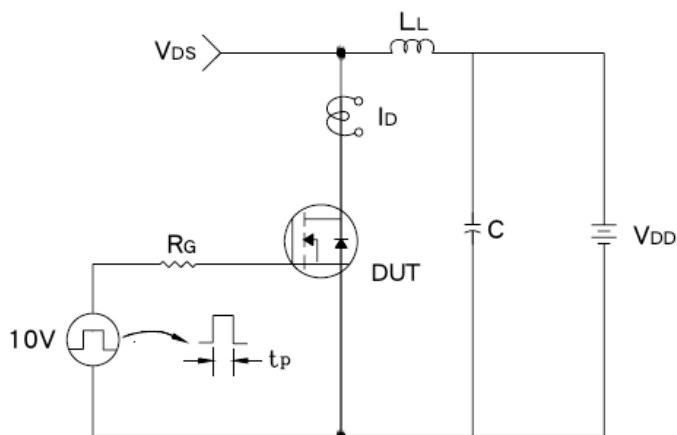
**Gate Charge Test Circuit & Waveform**



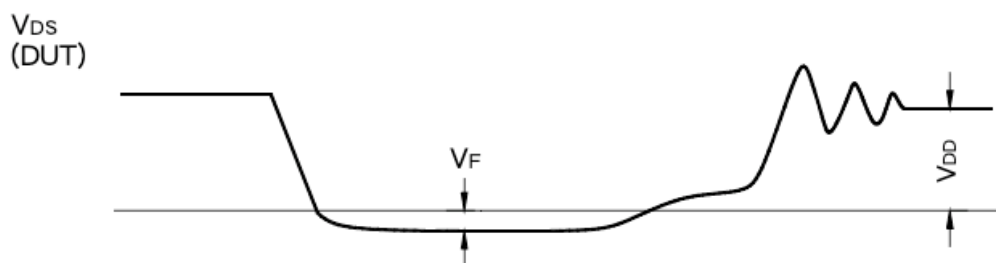
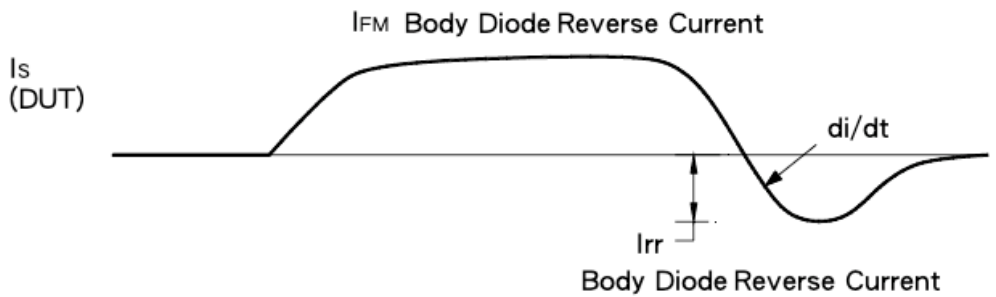
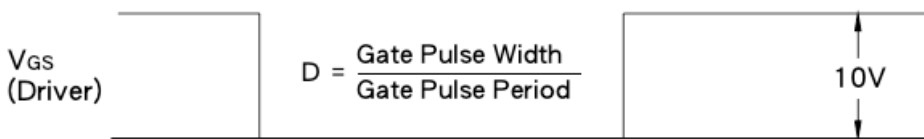
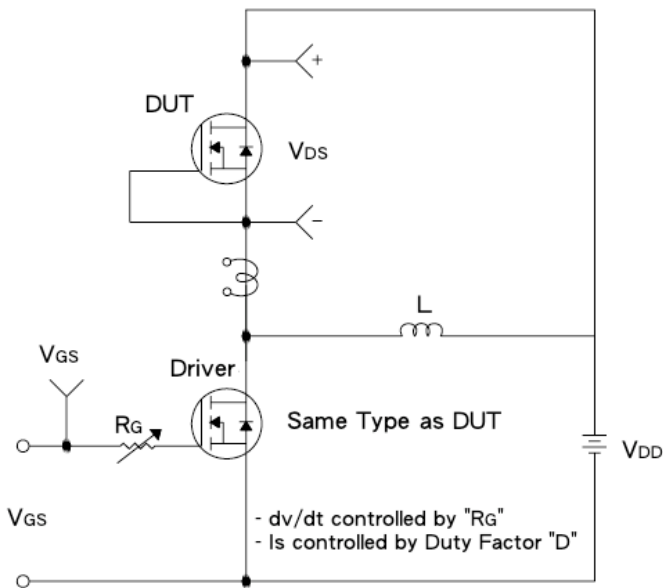
**Resistive Switching Test Circuit & Waveform**



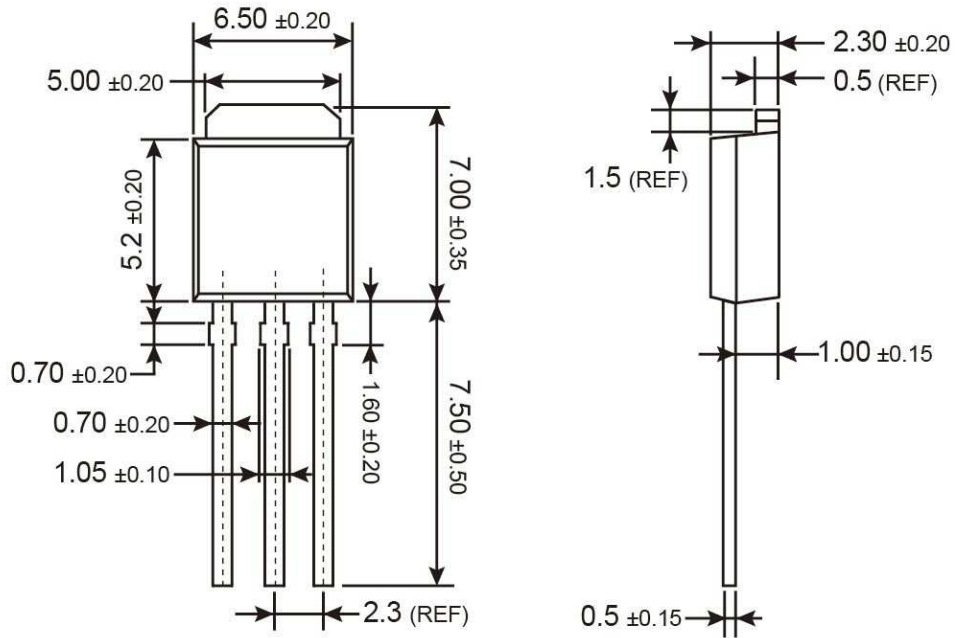
**E<sub>AS</sub> Test Circuit & Waveform**



**Diode Reverse Recovery Time Test Circuit & Waveform**

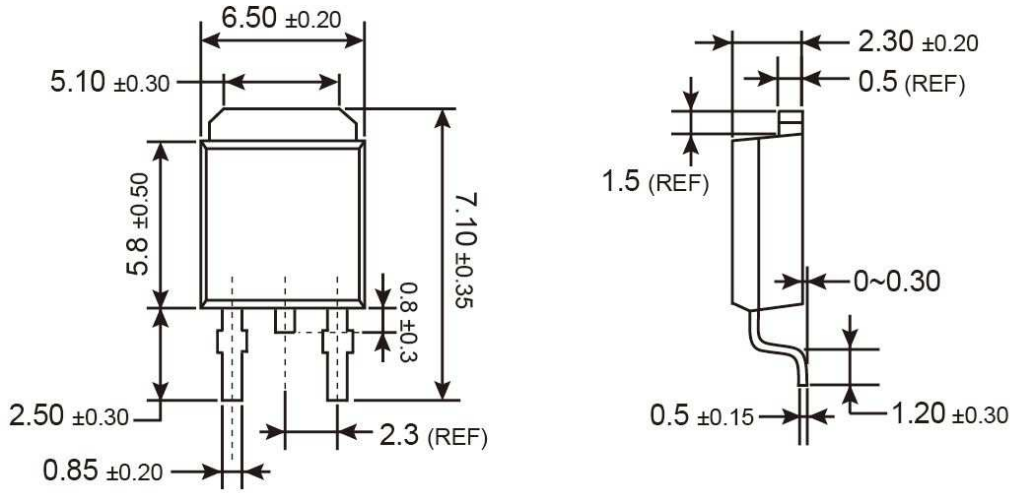


### TO-251 Mechanical Drawing



Unit: Millimeters

### TO-252 Mechanical Drawing



Unit: Millimeters

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