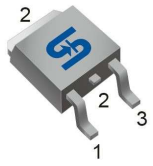
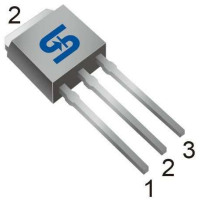
TSM70N10

100V N-Channel Power MOSFET

TO-252 (DPAK)

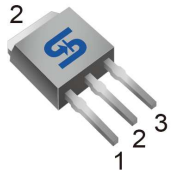


TO-251 (IPAK)



Pin Definition:
1. Gate
2. Drain
3. Source

TO-251S (IPAK SL)



Key Parameter Performance

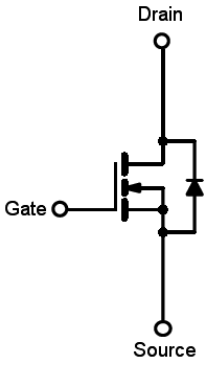
Parameter	Value	Unit
V_{DS}	100	V
$R_{DS(on)}$(max)	13	mΩ
Q_g	145	nC

Ordering Information

Part No.	Package	Packing
TSM70N10CP ROG	TO-252	2.5kpcs / 13" Reel
TSM70N10CH C5G	TO-251	75pcs / Tube
TSM70N10CH X0G	TO-251S	75pcs / Tube

Note: "G" denotes for Halogen- and Antimony-free as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

Block Diagram



N-Channel MOSFET

Absolute Maximum Ratings (T_A=25°C unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current (Note 3)	T_C=25°C	I_D	70	A
	T_C=70°C		61	
	T_A=25°C		12	
	T_A=70°C		9	
Drain Current-Pulsed (Note 1)		I_{DM}	150	A
Avalanche Current, L=0.5mH		I_{AS}, I_{AR}	25	A
Avalanche Energy, L=0.5mH		E_{AS}, E_{AR}	156	mJ
Maximum Power Dissipation (Note 2)	T_C=25°C	P_D	120	W
	T_C=70°C		80	
	T_A=25°C		8.3	
	T_A=70°C		5.3	
Storage Temperature Range		T_{STG}	-55 to +150	°C
Operating Junction Temperature Range		T_J	-55 to +150	°C

Thermal Performance

Parameter	Symbol	Limit	Unit
Thermal Resistance - Junction to Case	$R_{\Theta JC}$	1	°C/W
Thermal Resistance - Junction to Ambient	$R_{\Theta JA}$	40	°C/W

Electrical Specifications (T_J=25°C unless otherwise noted)

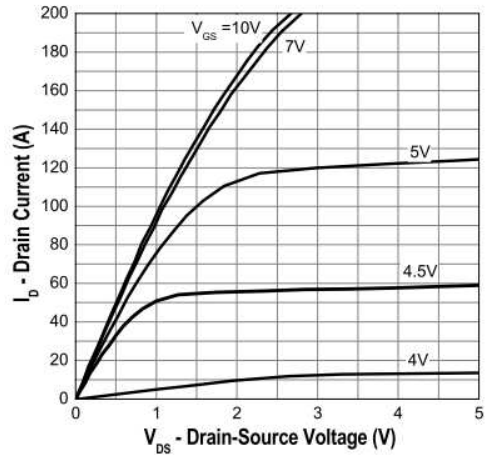
Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 250μA	BV_{DSS}	100	--	--	V
Drain-Source On-State Resistance	V_{GS} = 10V, I_D = 30A	$R_{DS(ON)}$	--	10	13	mΩ
Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	$V_{GS(TH)}$	2	3	4	V
Zero Gate Voltage Drain Current	V_{DS} = 80V, V_{GS} = 0V	I_{DSS}	--	--	1	μA
Gate Body Leakage	V_{GS} = ±20V, V_{DS} = 0V	I_{GSS}	--	--	±100	nA
Dynamic						
Total Gate Charge	V_{DS} = 50V, I_D = 30A, V_{GS} = 10V	Q_g	--	145	--	nC
Gate-Source Charge		Q_{gs}	--	25	--	
Gate-Drain Charge		Q_{gd}	--	43	--	
Input Capacitance	V_{DS} = 30V, V_{GS} = 0V, f = 1.0MHz	C_{iss}	--	4300	--	pF
Output Capacitance		C_{oss}	--	300	--	
Reverse Transfer Capacitance		C_{rss}	--	120	--	
Switching						
Turn-On Delay Time	V_{GS} = 10V, V_{DS} = 50V, R_G = 3Ω	$t_{d(on)}$	--	27	--	ns
Turn-On Rise Time		t_r	--	13	--	
Turn-Off Delay Time		$t_{d(off)}$	--	15	--	
Turn-Off Fall Time		t_f	--	42	--	
Drain-Source Diode Characteristics and Maximum Rating						
Drain-Source Diode Forward Voltage	V_{GS}=0V, I_S=30A	V_{SD}	--	0.8	1.3	V
Reverse Recovery Time	I_S = 30A, T_J=25°C dI/dt = 100A/μs	t_{rr}	--	165	--	ns
Reverse Recovery Charge		Q_{rr}	--	175	--	nC

Notes:

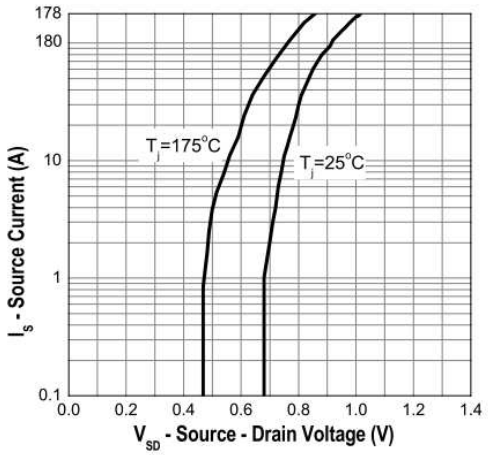
1. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
2. $R_{\Theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistances. The case thermal reference is defined at the solder mounting surface of the drain pins. $R_{\Theta JA}$ is guaranteed by design while $R_{\Theta CA}$ is determined by the user's board design. $R_{\Theta JA}$ shown below for single device operation on FR-4 PCB in still air
3. The maximum current is limited by package.

Electrical Characteristics Curves

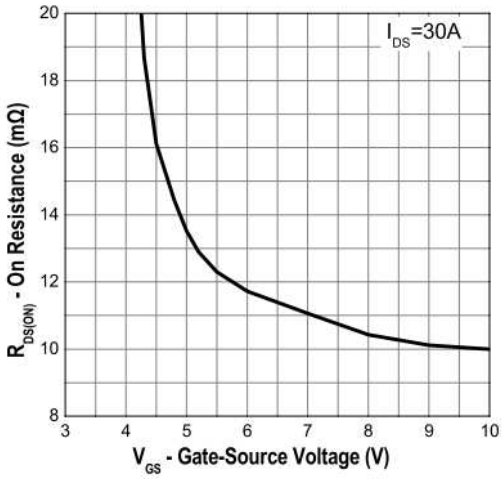
Output Characteristics



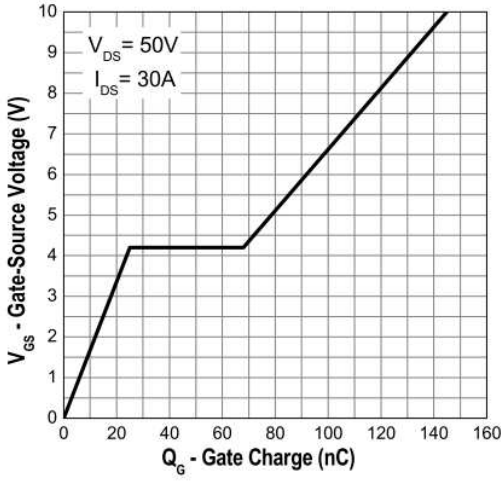
Transfer Characteristics



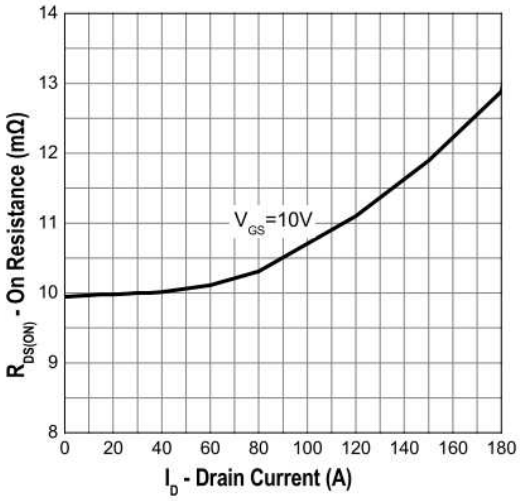
On-Resistance vs. Gate-Source Voltage



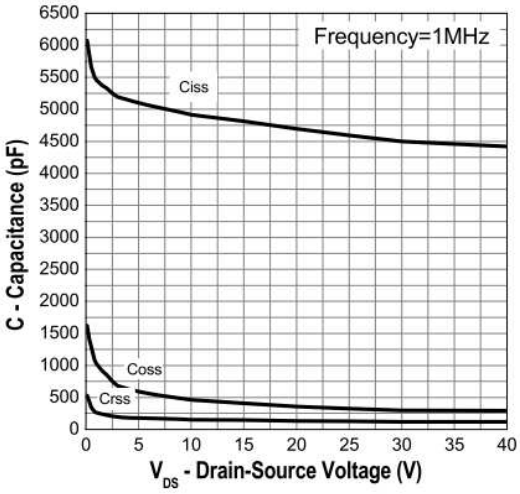
Gate Charge



On-Resistance vs. Junction Temperature

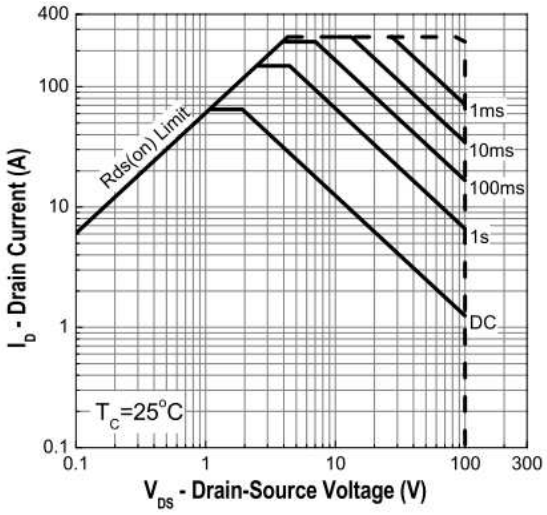


Capacitance

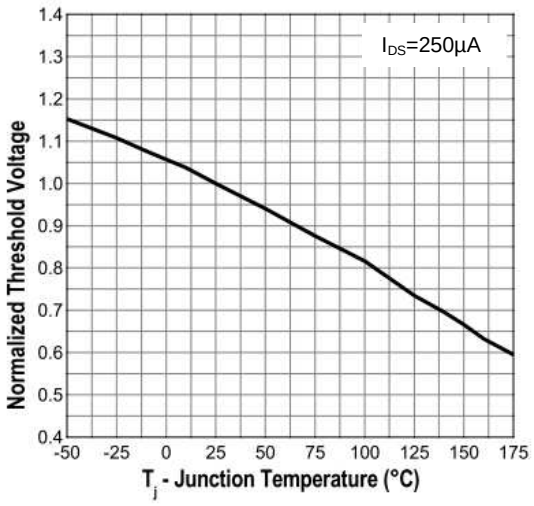


Electrical Characteristics Curves

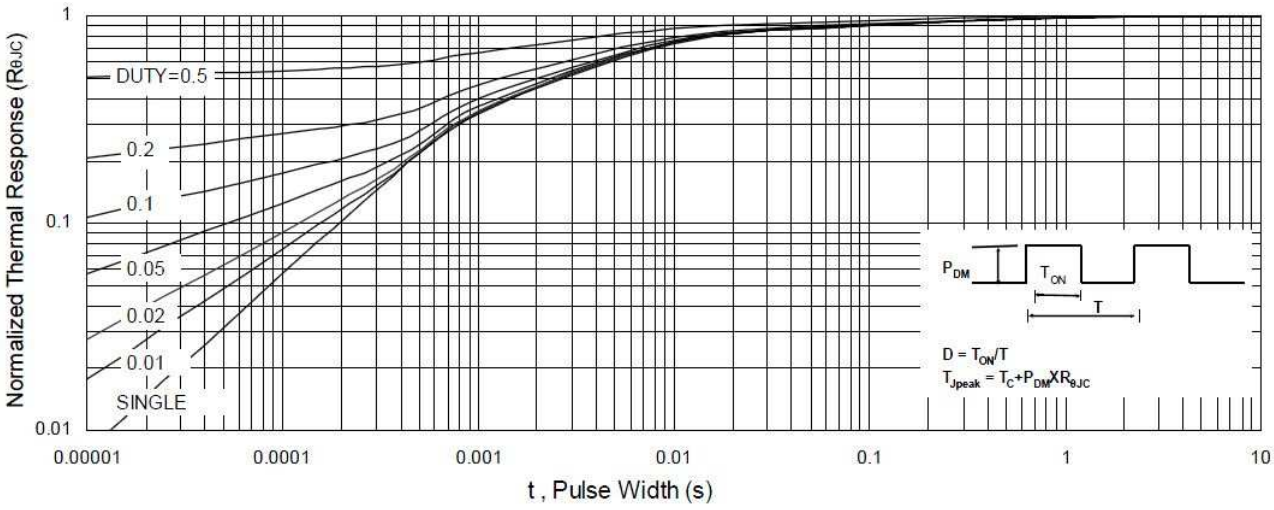
Maximum Safe Operating Area



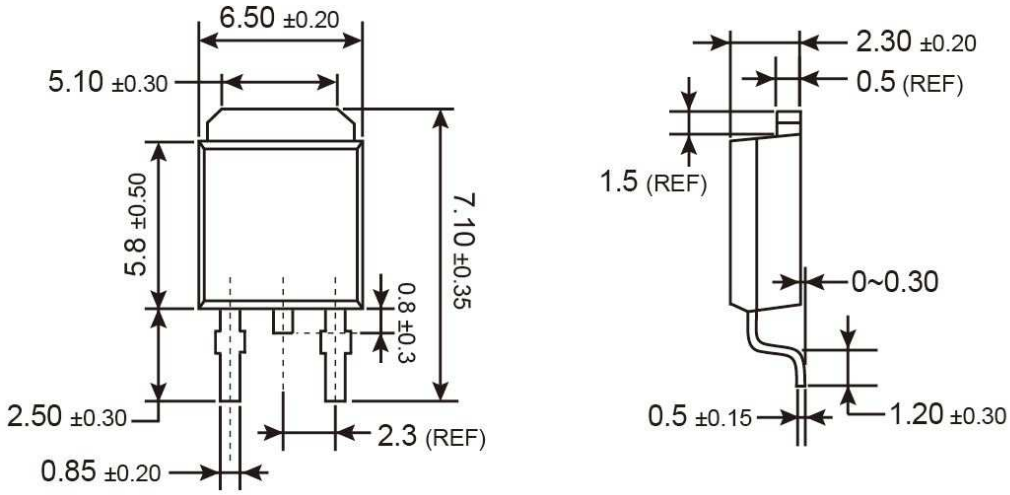
Threshold Voltage vs. Temperature



Normalized Thermal Transient Impedance, Junction-to-Ambient

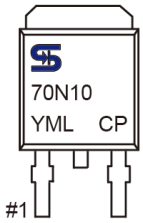


TO-252 Mechanical Drawing



Unit: Millimeters

Marking Diagram

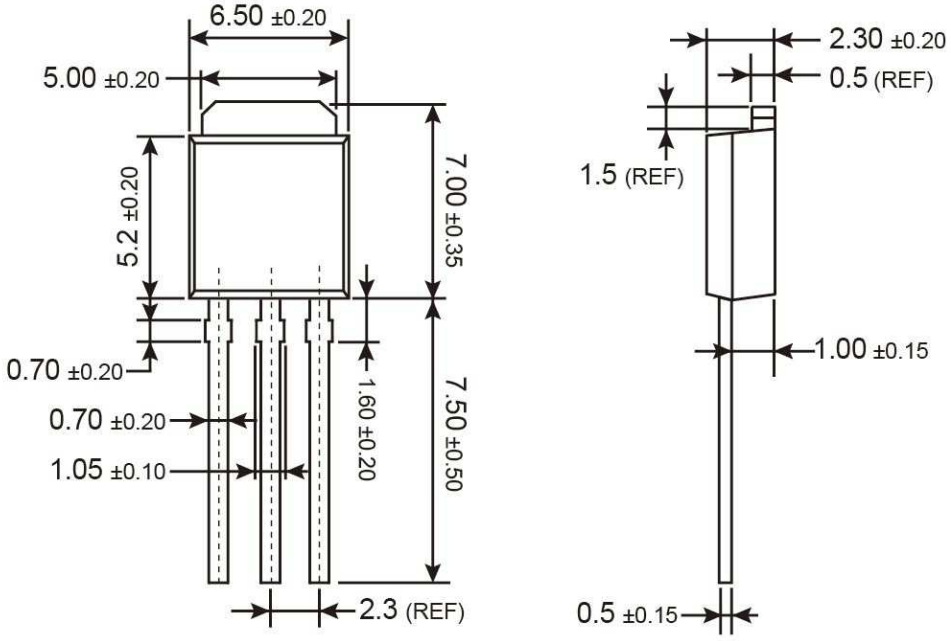


Y = Year Code

M = Month Code for Halogen Free Product
(**O**=Jan, **P**=Feb, **Q**=Mar, **R**=Apl, **S**=May, **T**=Jun, **U**=Jul, **V**=Aug, **W**=Sep, **X**=Oct, **Y**=Nov, **Z**=Dec)

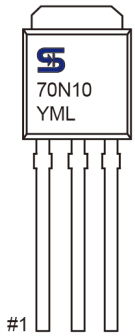
L = Lot Code

TO-251 (IPAK) Mechanical Drawing



Unit: Millimeters

Marking Diagram

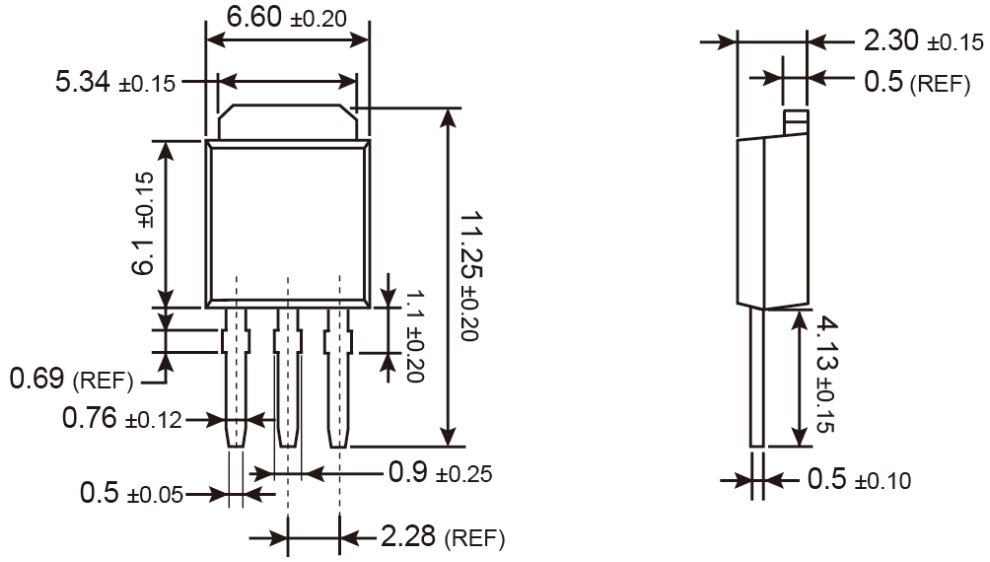


Y = Year Code

M = Month Code for Halogen Free Product
(**O**=Jan, **P**=Feb, **Q**=Mar, **R**=Apl, **S**=May, **T**=Jun, **U**=Jul, **V**=Aug, **W**=Sep, **X**=Oct, **Y**=Nov, **Z**=Dec)

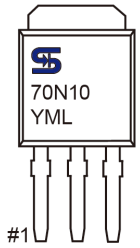
L = Lot Code

TO-251S (IPAK SL) Mechanical Drawing



Unit: Millimeters

Marking Diagram



Y = Year Code

M = Month Code for Halogen Free Product
(**O**=Jan, **P**=Feb, **Q**=Mar, **R**=Apl, **S**=May, **T**=Jun, **U**=Jul, **V**=Aug, **W**=Sep, **X**=Oct, **Y**=Nov, **Z**=Dec)

L = Lot Code

Notice

Specifications of the products displayed herein are subject to change without notice. TSC or anyone on its behalf, assumes no responsibility or liability for any errors or inaccuracies.

Information contained herein is intended to provide a product description only. No license, express or implied, to any intellectual property rights is granted by this document. Except as provided in TSC's terms and conditions of sale for such products, TSC assumes no liability whatsoever, and disclaims any express or implied warranty, relating to sale and/or use of TSC products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright, or other intellectual property right.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify TSC for any damages resulting from such improper use or sale.