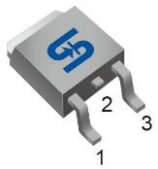
TAIWAN SEMICONDUCTOR

RoHS COMPLIANCE

TSM60N06

60V N-Channel Power MOSFET

TO-252 (DPAK)



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

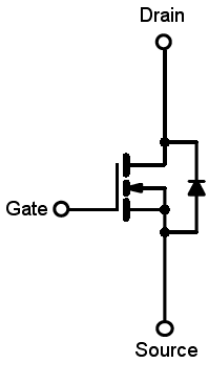
PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$(mΩ)	I_D (A)
60	7.3 @ V_{GS}=10V	66

Features

- Advanced Trench Technology
- Low $R_{DS(ON)}$ 7.3mΩ (Max.)
- Low gate charge typical @ 81nC (Typ.)
- Low Crss typical @ 339pF (Typ.)

Block Diagram



N-Channel MOSFET

Ordering Information

Part No.	Package	Packing
TSM60N06CP ROG	TO-252	2.5Kpcs / 13" Reel

Note: "G" denote for Halogen Free Product

Absolute Maximum Rating (T_C = 25℃ unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_C = 25℃	I_D	66	A
	T_C = 70℃		53	
	T_A = 25℃		13	
	T_A = 70℃		10	
Drain Current-Pulsed Note 1		I_{DM}	150	A
Avalanche Current, L = 0.1mH		I_{AS}, I_{AR}	53	A
Avalanche Energy, L = 0.1mH		E_{AS}, E_{AR}	400	mJ
Maximum Power Dissipation	T_C = 25℃	P_D	44.6	W
	T_C = 70℃		28.6	
	T_A = 25℃		2	
	T_A = 70℃		1.3	
Storage Temperature Range		T_{STG}	-55 to +150	℃
Operating Junction Temperature Range		T_J	-55 to +150	℃

* Limited by maximum junction temperature

Thermal Performance

Parameter	Symbol	Limit	Unit
Thermal Resistance - Junction to Case	$R_{\Theta JC}$	2.8	℃/W
Thermal Resistance - Junction to Ambient	$R_{\Theta JA}$	62	℃/W

TSM60N06

60V N-Channel Power MOSFET

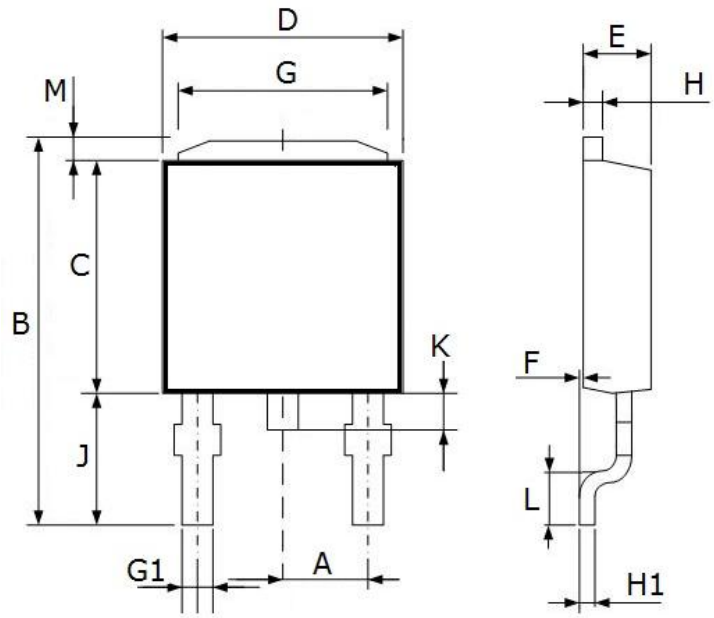
Electrical Specifications (T_C = 25℃ unless otherwise noted)

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 250uA	BV_{DSS}	60	--	--	V
Drain-Source On-State Resistance	V_{GS} = 10V, I_D = 30A	$R_{DS(ON)}$	--	6.3	7.3	mΩ
Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250uA	$V_{GS(TH)}$	2	3	4	V
Zero Gate Voltage Drain Current	V_{DS} = 48V, V_{GS} = 0V	I_{DSS}	--	--	1	uA
Gate Body Leakage	V_{GS} = ±20V, V_{DS} = 0V	I_{GSS}	--	--	±100	nA
Dynamic						
Total Gate Charge	V_{DS} = 30V, I_D = 30A, V_{GS} = 10V	Q_g	--	81	--	nC
Gate-Source Charge		Q_{gs}	--	23	--	
Gate-Drain Charge		Q_{gd}	--	24	--	
Input Capacitance	V_{DS} = 30V, V_{GS} = 0V, f = 1.0MHz	C_{iss}	--	4382	--	pF
Output Capacitance		C_{oss}	--	668	--	
Reverse Transfer Capacitance		C_{rss}	--	339	--	
Switching						
Turn-On Delay Time	V_{GS} = 10V, V_{DS} = 30V, R_G = 3.3Ω, I_D = 30A	$t_{d(on)}$	--	25	--	nS
Turn-On Rise Time		t_r	--	19	--	
Turn-Off Delay Time		$t_{d(off)}$	--	85	--	
Turn-Off Fall Time		t_f	--	43	--	
Drain-Source Diode Characteristics and Maximum Rating						
Drain-Source Diode Forward Voltage	V_{GS} = 0V, I_S = 20A	V_{SD}	-	0.8	1.3	V
Reverse Recovery Time	I_S = 30A, T_J = 25℃ dI/dt = 100A/us	t_{fr}		36		nS
Reverse Recovery Charge		Q_{fr}		53		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 resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. $R_{\theta JC}$ 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 in still air

TO-252 Mechanical Drawing



TO-252 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.286 BSC		0.090 BSC	
B	9.40	10.40	0.370	0.409
C	5.40	6.23	0.213	0.245
D	6.40	6.80	0.252	0.268
E	2.20	2.40	0.087	0.094
F	0.00	0.20	0.000	0.008
G	5.20	5.50	0.205	0.217
G1	0.50	0.91	0.020	0.036
H	0.45	0.60	0.018	0.024
H1	0.40	0.60	0.016	0.024
J	2.50	2.90	0.098	0.114
K	0.60	1.00	0.023	0.039
L	1.40	1.78	0.055	0.070
M	0.88	1.28	0.034	0.050

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.