

TO-252
(DPAK)



Pin Definition:

1. Gate
2. Drain
3. Source

PRODUCT SUMMARY

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

Features

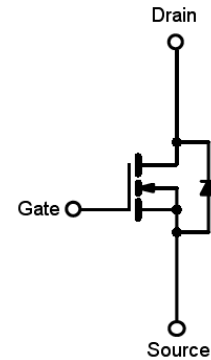
- Advanced Trench Technology
- Low $R_{DS(on)}$ 7.3m Ω (Max.)
- Low gate charge typical @ 81nC (Typ.)
- Low C_{rss} typical @ 339pF (Typ.)

Ordering Information

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

Note: "G" denote for Halogen Free Product

Block Diagram



N-Channel MOSFET

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

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

* Limited by maximum junction temperature

Thermal Performance

Parameter	Symbol	Limit	Unit
Thermal Resistance - Junction to Case	$R_{\theta JC}$	2.8	$^\circ\text{C/W}$
Thermal Resistance - Junction to Ambient	$R_{\theta JA}$	62	$^\circ\text{C/W}$

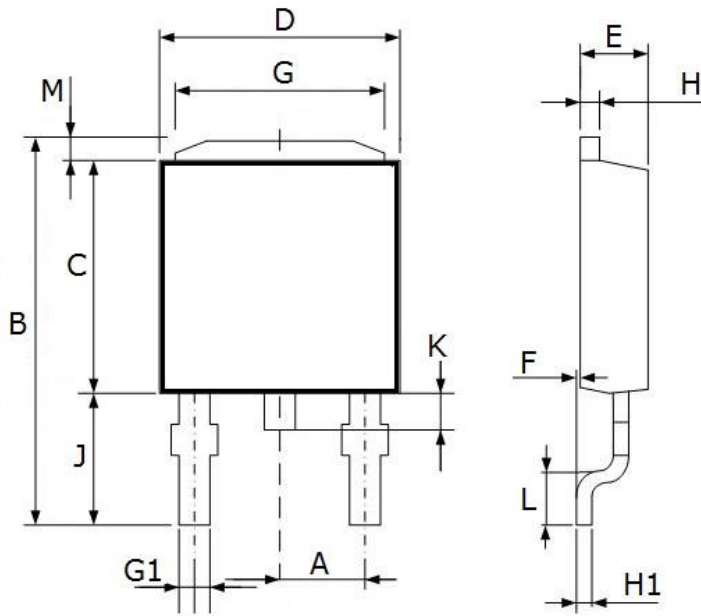
Electrical Specifications ($T_C = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	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	$V_{DS} = V_{GS}, I_D = 250\mu A$	$V_{GS(TH)}$	2	3	4	V
Zero Gate Voltage Drain Current	$V_{DS} = 48V, V_{GS} = 0V$	I_{DSS}	--	--	1	μA
Gate Body Leakage	$V_{GS} = \pm 20V, V_{DS} = 0V$	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	$V_{GS} = 10V, V_{DS} = 30V,$ $R_G = 3.3\Omega, I_D = 30A$	$t_{d(on)}$	--	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	$I_S = 30A, T_J = 25^\circ C$	t_{fr}		36		nS
Reverse Recovery Charge	$di/dt = 100A/\mu s$	Q_{fr}		53		nC

Notes:

- Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
- $R_{\theta JA}$ 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

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