

TO-252
(DPAK)



Pin Definition:

1. Gate
2. Drain
3. Source

PRODUCT SUMMARY

V _{DS} (V)	R _{DS(on)} (mΩ)	I _D (A)
30	4.5 @ V _{GS} =10V	60

Features

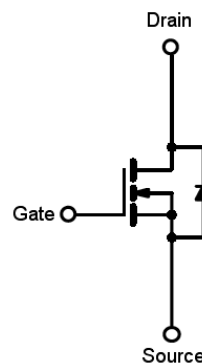
- Advanced Trench Technology
- Low R_{DS(ON)} 4.5mΩ (Max.)
- Low gate charge typical @ 12nC (Typ.)
- Low Crss typical @ 140pF (Typ.)

Ordering Information

Part No.	Package	Packing
TSM60N03CP 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°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V _{DS}	30	V
Gate-Source Voltage	V _{GS}	±20	V
Continuous Drain Current	I _D	T _C = 25°C	60
		T _C = 70°C	48
		T _A = 25°C	19
		T _A = 70°C	15
Drain Current-Pulsed *	I _{DM}	140	A
Avalanche Current, L = 0.1mH	I _{AS} , I _{AR}	38	A
Avalanche Energy, L = 0.1mH	E _{AS} , E _{AR}	72	mJ
Maximum Power Dissipation	P _D	T _C = 25°C	41
		T _C = 70°C	26
		T _A = 25°C	2.5
		T _A = 70°C	1.6
Storage Temperature Range	T _{STG}	-55 to +150	°C
Operating Junction Temperature Range	T _J	-55 to +150	°C

* Limited by maximum junction temperature

Thermal Performance

Parameter	Symbol	Limit	Unit
Thermal Resistance - Junction to Case	R _{θJC}	3	°C/W
Thermal Resistance - Junction to Ambient	R _{θJA}	50	°C/W

Notes: Surface mounted on FR4 board t ≤ 10sec

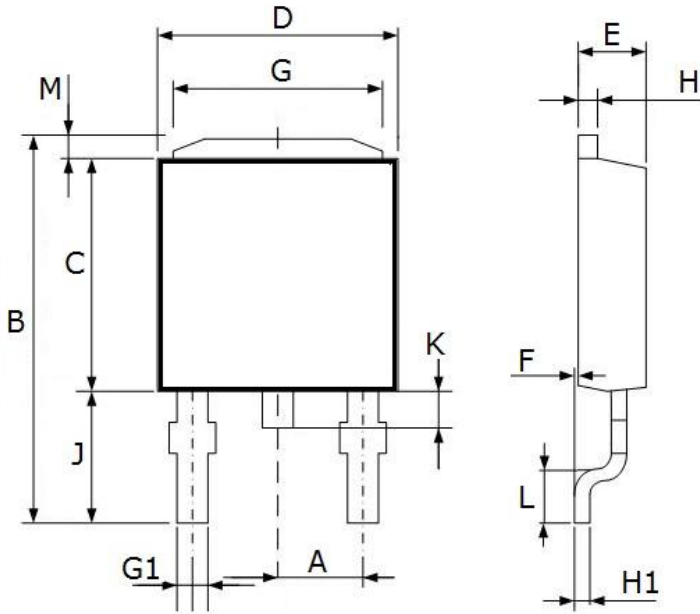
Electrical Specifications (T_C = 25°C unless otherwise noted)

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = 250uA	BV _{DSS}	30	--	--	V
Drain-Source On-State Resistance	V _{GS} = 10V, I _D = 19A	R _{DS(ON)}	--	3.5	4.5	mΩ
	V _{GS} = 4.5V, I _D = 16A	R _{DS(ON)}	--	4.6	5.8	mΩ
Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250uA	V _{GS(TH)}	1.15	--	2.2	V
Zero Gate Voltage Drain Current	V _{DS} = 30V, 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} = 15V, I _D = 19A, V _{GS} = 4.5V	Q _g	--	12	--	nC
Gate-Source Charge		Q _{gs}	--	5.4	--	
Gate-Drain Charge		Q _{gd}	--	4.6	--	
Input Capacitance	V _{DS} = 15V, V _{GS} = 0V, f = 1.0MHz	C _{iss}	--	1700	--	pF
Output Capacitance		C _{oss}	--	350	--	
Reverse Transfer Capacitance		C _{rss}	--	140	--	
Switching						
Turn-On Delay Time	V _{GS} = 4.5V, V _{DS} = 15V, R _G = 1.5Ω, I _D = 10A	t _{d(on)}	--	25	--	nS
Turn-On Rise Time		t _r	--	20	--	
Turn-Off Delay Time		t _{d(off)}	--	25	--	
Turn-Off Fall Time		t _f	--	15	--	
Drain-Source Diode Characteristics and Maximum Rating						
Drain-Source Diode Forward Voltage	V _{GS} = 0V, I _S = 10A	V _{SD}	-	0.8	1.2	V
Reverse Recovery Time	I _S = 10A, T _J = 25°C	t _{fr}		25		nS
Reverse Recovery Charge	di/dt = 100A/us	Q _{fr}		17		nC

Notes:

1. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
2. R_{θJA} 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_{θJC} is guaranteed by design while R_{θCA} is determined by the user's board design. R_{θJA} shown below for single device operation on FR-4 in still air
3. The maximum current rating is limited by package

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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