



Pin Definition:

1. Gate
2. Drain
3. Source

PRODUCT SUMMARY

V _{DS} (V)	R _{DS(on)} (mΩ)	I _D (A)
60	3.1 @ V _{GS} =10V	210

Features

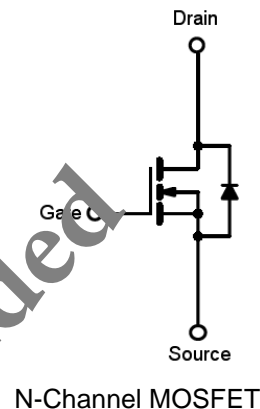
- Advanced Trench Technology
- Low R_{DS(ON)} 3.1mΩ (Max.)
- Low gate charge typical @ 160nC (Typ.)
- Low Crss typical @ 300pF (Typ.)

Ordering Information

Part No.	Package	Packing
TSM210N06CZ C0G	TO-220	50pcs / Tube

Note: "G" denote for Green Product.

Block Diagram



Absolute Maximum Rating (T_a = 25°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°C	210
		T _C =70°C	170
		T _A =25°C	19
		T _A =70°C	15.2
Drain Current-Pulsed Note 1	I _{DM}	650	A
Avalanche Current, L=0.3mH	I _{AS} , I _{AR}	113	A
Avalanche Energy, L=0.3mH	E _{AS} , E _{AR}	1900	mJ
Maximum Power Dissipation	P _D	T _C =25°C	250
		T _C =70°C	160
		T _A =25°C	2
		T _A =70°C	1.3
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}	0.5	°C/W
Thermal Resistance - Junction to Ambient	R _{θJA}	62.5	°C/W

Notes: Surface mounted on FR4 board t ≤ 10sec

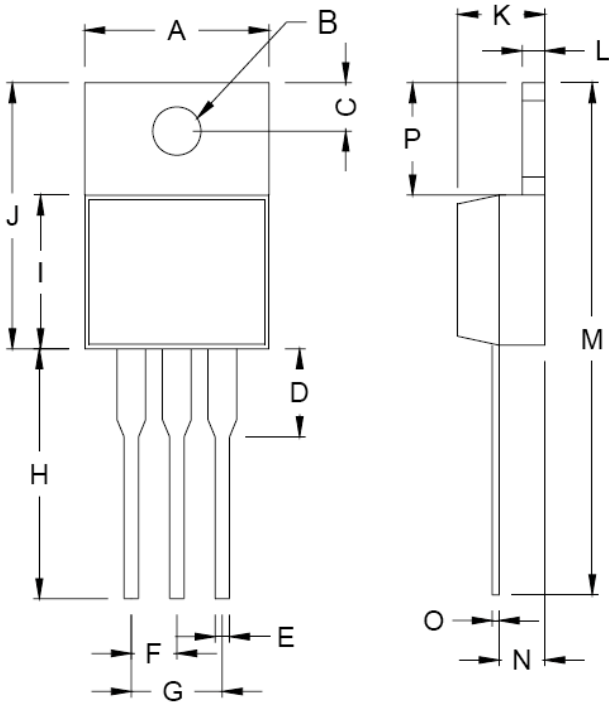
Electrical Specifications (Ta = 25°C unless otherwise noted)

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	$V_{GS} = 10V, I_D = 90A$	$R_{DS(ON)}$	--	2.6	3.1	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	--	160	--	nC
Gate-Source Charge		Q_{gs}	--	35	--	
Gate-Drain Charge		Q_{gd}	--	40	--	
Input Capacitance	$V_{DS} = 30V, V_{GS} = 0V,$ $f = 1.0MHz$	C_{iss}	--	7900	--	pF
Output Capacitance		C_{oss}	--	780	--	
Reverse Transfer Capacitance		C_{rss}	--	30	--	
Switching						
Turn-On Delay Time	$V_{GS} = 10V, V_{DS} = 30V,$ $R_G = 3.3\Omega$	$t_{d(on)}$	--	25	--	nS
Turn-On Rise Time		t_r	--	40	--	
Turn-Off Delay Time		$t_{d(off)}$	--	85	--	
Turn-Off Fall Time		t_f	--	45	--	
Drain-Source Diode Characteristics and Maximum Rating						
Drain-Source Diode Forward Voltage	$V_{GS} = 0V, I_S = 90A$	V_{SD}	-	0.8	1.3	V
Reverse Recovery Time	$I_S = 90A, I_J = 25^\circ C$	t_{fr}		70		nS
Reverse Recovery Charge	$di/dt = 100A/\mu s$	Q_{fr}		115		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-220 Mechanical Drawing



TO-220 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	10.000	10.500	0.394	0.413
B	3.740	3.910	0.147	0.154
C	2.440	2.940	0.096	0.116
D	-	6.350	-	0.250
E	0.381	1.106	0.015	0.040
F	2.345	2.715	0.092	0.058
G	4.690	5.480	0.092	0.107
H	12.700	14.732	0.500	0.581
J	14.220	16.510	0.560	0.650
K	3.550	4.826	0.140	0.190
L	0.508	1.397	0.020	0.055
M	27.700	29.620	1.060	1.230
N	2.032	2.921	0.080	0.115
O	0.255	0.610	0.010	0.024
P	5.842	6.858	0.230	0.270

Not Recommended

Not Recommended

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