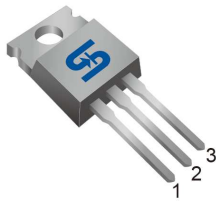


TO-220



Pin Definition:

1. Gate
2. Drain
3. Source

PRODUCT SUMMARY

V _{DS} (V)	R _{DS(on)} (mΩ)	I _D (A)
100	5.5 @ V _{GS} =10V	160

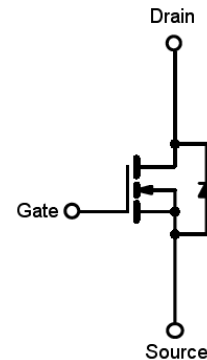
Features

- Advanced Trench Technology
- Low R_{DS(ON)} 5.5mΩ (Max.)
- Low gate charge typical @ 154nC (Typ.)
- Low Crss typical @ 260pF (Typ.)

Ordering Information

Part No.	Package	Packing
TSM160N10CZ C0	TO-220	50pcs / Tube

Block Diagram



N-Channel MOSFET

Absolute Maximum Rating (Ta = 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	I _D	T _C =25°C	160
		T _C =70°C	127
		T _A =25°C	14.2
		T _A =70°C	11.4
Drain Current-Pulsed Note 1	I _{DM}	620	A
Avalanche Current, L=0.5mH	I _{AS} , I _{AR}	40	A
Avalanche Energy, L=0.5mH	E _{AS} , E _{AR}	400	mJ
Maximum Power Dissipation	P _D	T _C =25°C	300
		T _C =70°C	210
		T _A =25°C	2.4
		T _A =70°C	1.68
Storage Temperature Range	T _{STG}	-55 to +175	°C
Operating Junction Temperature Range	T _J	-55 to +175	°C

* Limited by maximum junction temperature

Thermal Performance

Parameter	Symbol	Limit	Unit
Thermal Resistance - Junction to Case	Rθ _{JC}	0.5	°C/W
Thermal Resistance - Junction to Ambient	Rθ _{JA}	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}	100	--	--	V
Drain-Source On-State Resistance	$V_{GS} = 10V, I_D = 30A$	$R_{DS(ON)}$	--	4.5	5.5	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	$V_{DS} = 80V, V_{GS} = 0V$	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	--	154	--	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}	--	9840	--	pF
Output Capacitance		C_{oss}	--	750	--	
Reverse Transfer Capacitance		C_{rss}	--	260	--	
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	$V_{GS}=0V, I_S=30A$	V_{SD}	-	0.8	1.3	V
Reverse Recovery Time	$I_S = 30A, T_J=25^\circ C$ $di/dt = 100A/\mu s$	t_{fr}		120		nS
Reverse Recovery Charge		Q_{fr}		160		nC

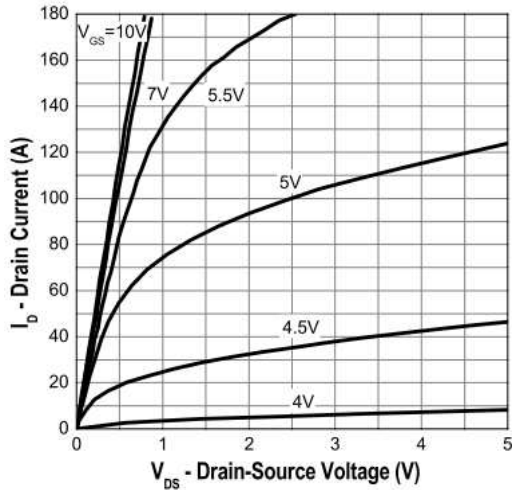
Notes:

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

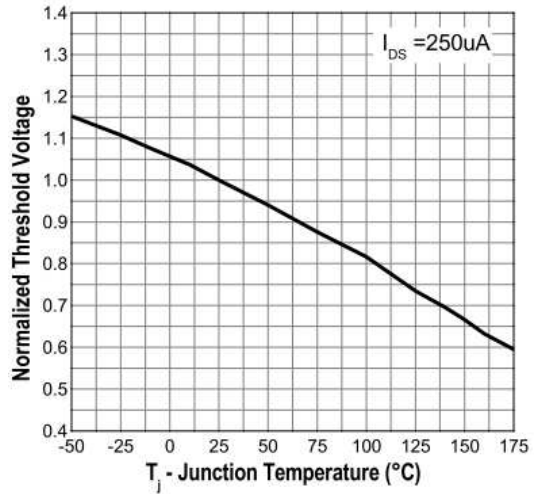


Electrical Characteristics Curve ($T_a = 25^\circ\text{C}$, unless otherwise noted)

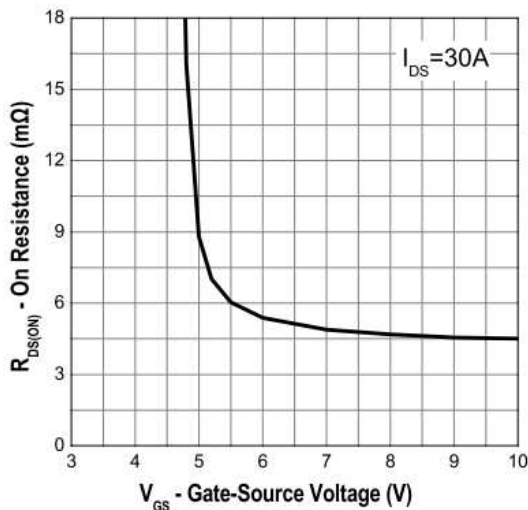
Output Characteristics



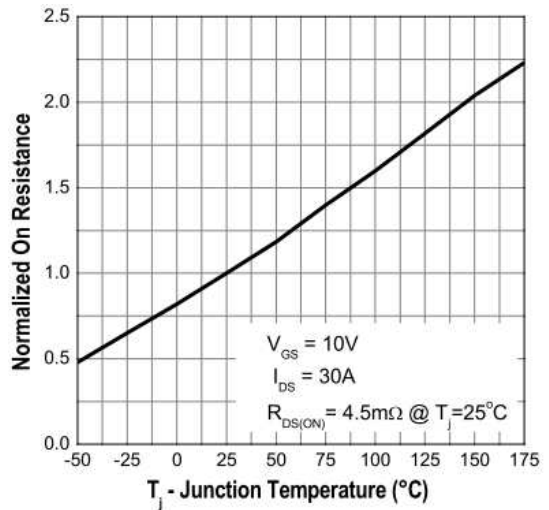
Gate Threshold Voltage



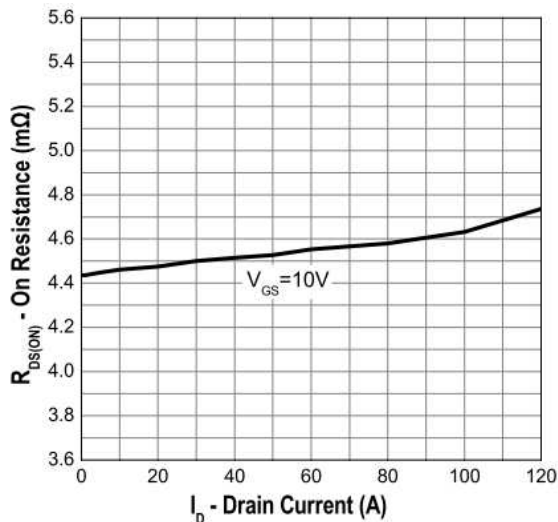
Gate Source On Resistance



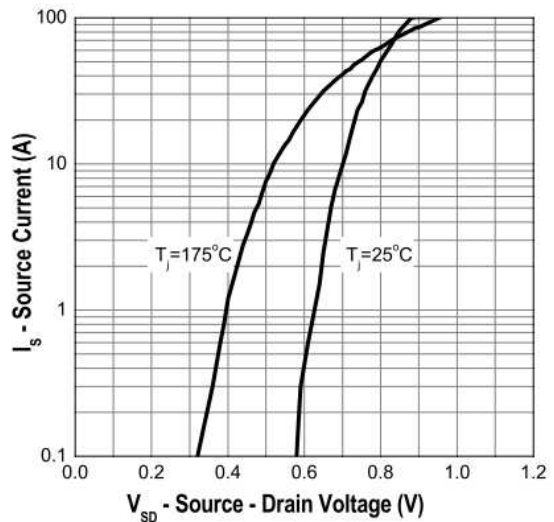
Drain-Source On Resistance



Drain-Source On-Resistance



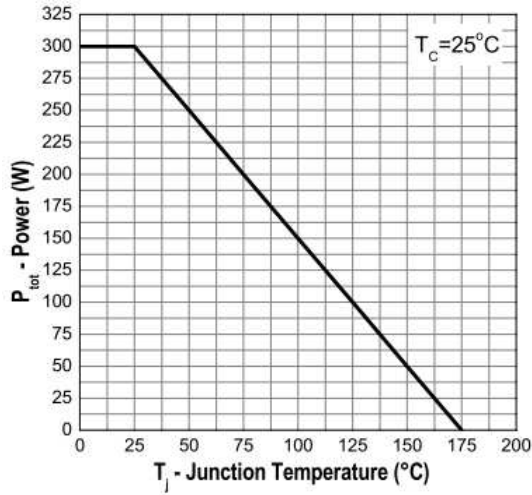
Source-Drain Diode Forward Voltage



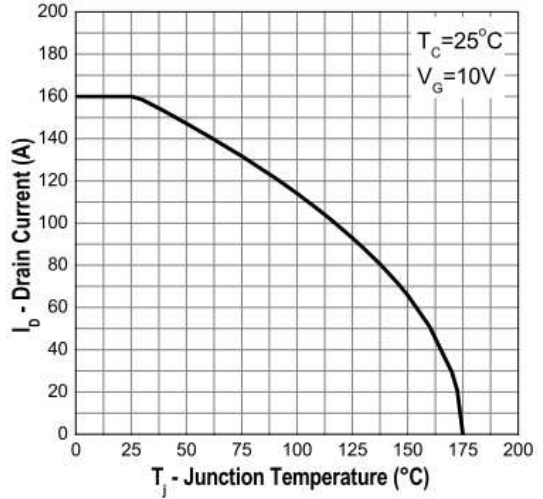


Electrical Characteristics Curve ($T_a = 25^\circ\text{C}$, unless otherwise noted)

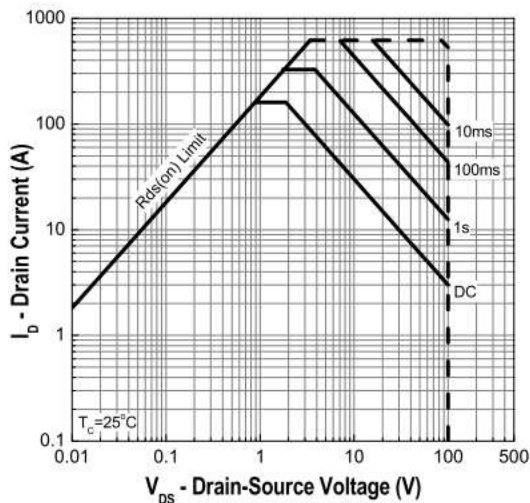
Power Derating



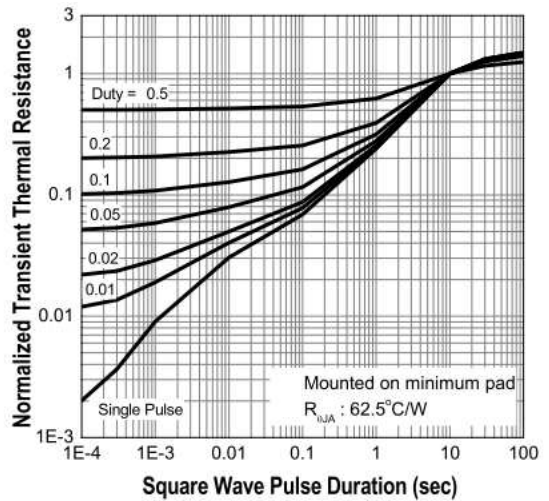
Drain Current vs. Junction Temperature



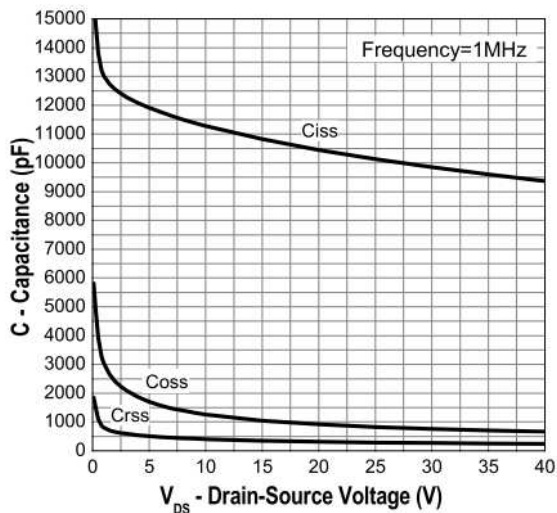
Safe Operation Area



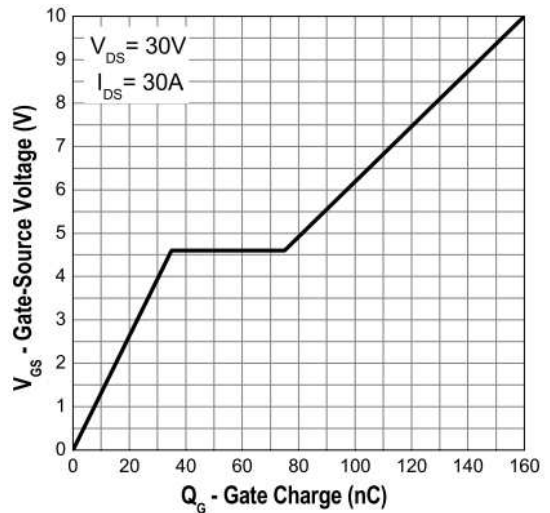
Transient Thermal Impedance



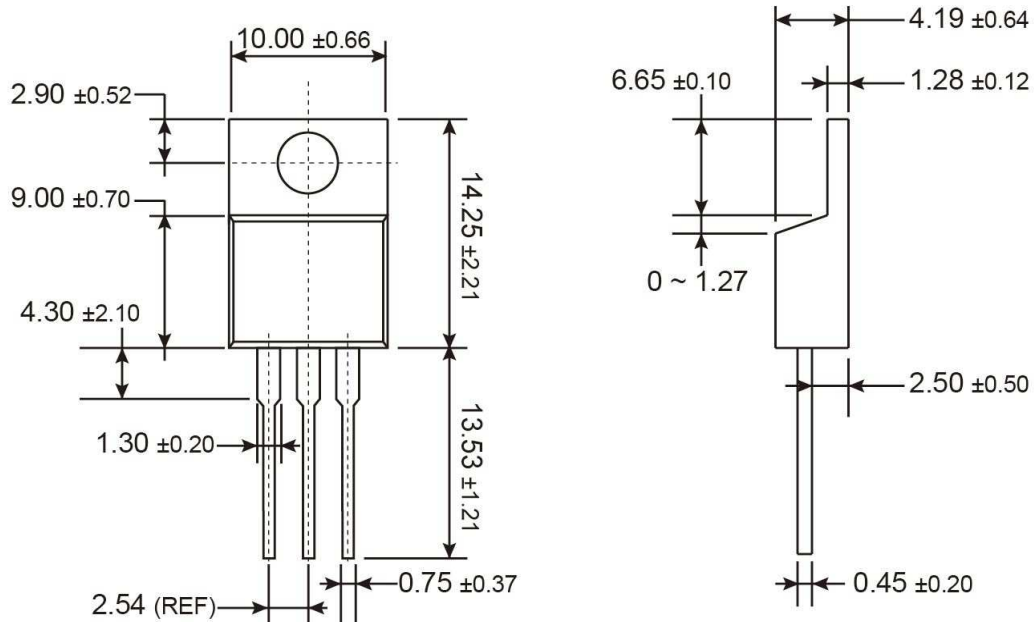
Capacitance



Gate Charge

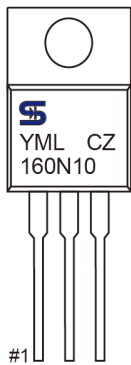


TO-220 Mechanical Drawing



Unit: Millimeters

Marking Diagram



- Y** = Year Code
- M** = Month Code
(**A**=Jan, **B**=Feb, **C**=Mar, **D**=Apr, **E**=May, **F**=Jun, **G**=Jul, **H**=Aug, **I**=Sep, **J**=Oct, **K**=Nov, **L**=Dec)
- L** = Lot Code

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