

N-Channel Power MOSFET

100V, 160A, 5.5mΩ

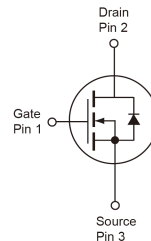
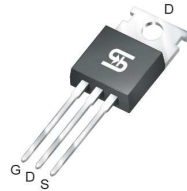
FEATURES

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

KEY PERFORMANCE PARAMETERS

PARAMETER	VALUE	UNIT
V_{DS}	100	V
$R_{DS(on)}$ (max)	5.5	mΩ
Q_g	154	nC


ROHS
COMPLIANT

HALOGEN
FREE
TO-220

Notes: Moisture sensitivity level: level 3. Per J-STD-020

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

PARAMETER		SYMBOL	LIMIT	UNIT
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current ^(Note 1)	$T_C = 25^\circ\text{C}$	I_D	160	A
	$T_C = 70^\circ\text{C}$		127	
	$T_A = 25^\circ\text{C}$		14.2	A
	$T_A = 70^\circ\text{C}$		11.4	
Pulsed Drain Current ^(Note 2)		I_{DM}	620	A
Total Power Dissipation	$T_C = 25^\circ\text{C}$	P_{DTOT}	300	W
	$T_C = 70^\circ\text{C}$		210	
	$T_A = 25^\circ\text{C}$		2.4	W
	$T_A = 70^\circ\text{C}$		1.68	
Single Pulsed Avalanche Energy ^(Note 3)		E_{AS}, E_{AR}	400	mJ
Single Pulsed Avalanche Current ^(Note 3)		I_{AS}, I_{AR}	40	A
Operating Junction and Storage Temperature Range		T_J, T_{STG}	- 55 to +175	$^\circ\text{C}$

THERMAL PERFORMANCE

PARAMETER	SYMBOL	LIMIT	UNIT
Junction to Case Thermal Resistance	$R_{\theta JC}$	0.5	$^{\circ}\text{C/W}$
Junction to Ambient Thermal Resistance	$R_{\theta JA}$	62.5	$^{\circ}\text{C/W}$

Notes: $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistances. The case thermal reference is defined at the solder mounting surface of the drain pins. $R_{\theta JA}$ 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 PCB in still air.

ELECTRICAL SPECIFICATIONS ($T_A = 25^{\circ}\text{C}$ unless otherwise noted)

PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNIT
Static ^(Note 4)						
Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = 250uA	BV _{DSS}	100	--	--	V
Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	V _{GS(TH)}	2	3	4	V
Zero Gate Voltage Drain Current	V _{DS} = 80V, V _{GS} = 0V	I _{DSS}	--	--	1	uA
Gate Body Leakage	V _{GS} = ±20V, V _{DS} = 0V	I _{GSS}	--	--	±100	nA
Drain-Source On-State Resistance	V _{GS} = 10V, I _D = 30A	R _{DS(on)}	--	4.5	5.5	mΩ
Dynamic ^(Note 5)						
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 ^(Note 6)						
Turn-On Delay Time	V _{GS} = 10V, V _{DS} = 30V, R _G = 3.3Ω	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	--	
Source-Drain Diode ^(Note 4)						
Forward Voltage	V _{GS} =0V, I _S =30A	V _{SD}	-	0.8	1.3	V
Reverse Recovery Time	I _S = 30A , T _J = 25°C	t _{rr}		120		nS
Reverse Recovery Charge	dI/dt = 100A/us	Q _{rr}		160		nC

Notes:

- Current limited by package.
- Pulse width limited by the maximum junction temperature.
- $L = 0.5\text{mH}, I_{AS} = 40\text{A}, V_{DD} = 50\text{V}, R_G = 25\Omega$, Starting $T_J = 25^{\circ}\text{C}$
- Pulse test: $PW \leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
- For DESIGN AID ONLY, not subject to production testing.
- Switching time is essentially independent of operating temperature.

ORDERING INFORMATION

PART NO.	PACKAGE	PACKING
TSM160N10CZ C0G	TO-220	50pcs / Tube

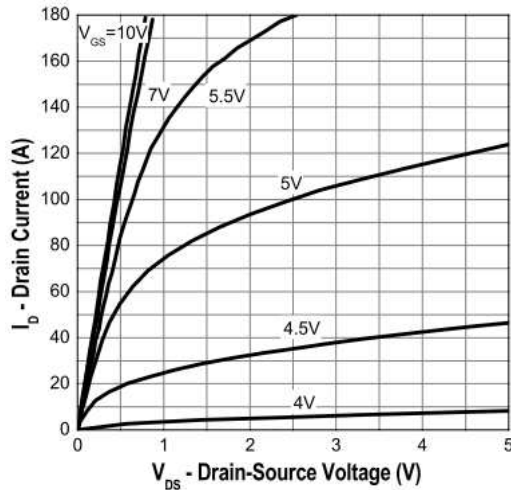
Note:

1. Compliant to RoHS Directive 2011/65/EU and in accordance to WEEE 2002/96/EC
2. Halogen-free according to IEC 61249-2-21 definition

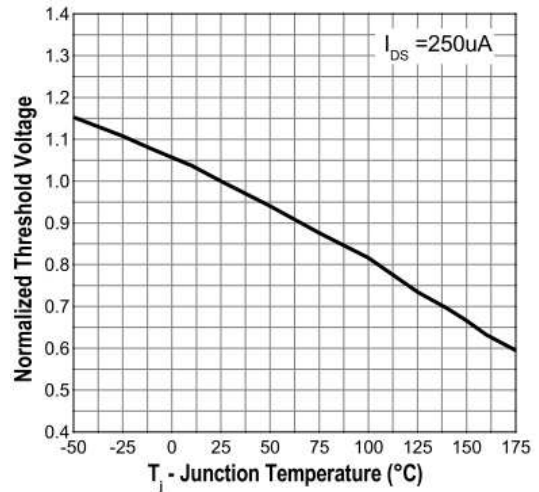
CHARACTERISTICS CURVES

($T_A = 25^\circ\text{C}$ unless otherwise noted)

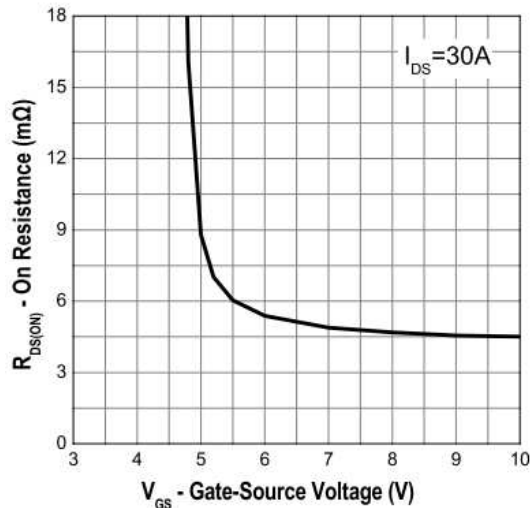
Output Characteristics



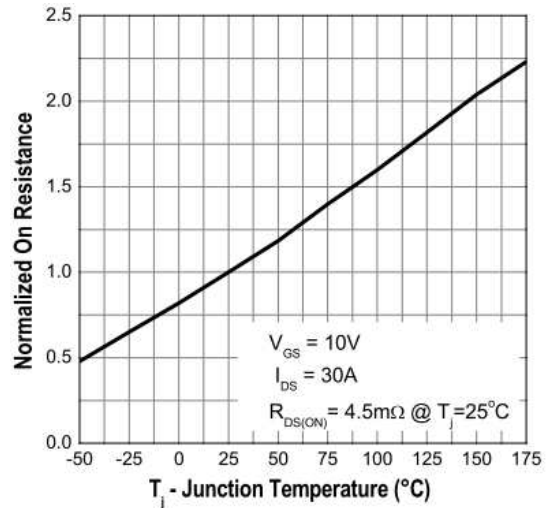
Gate Threshold Voltage



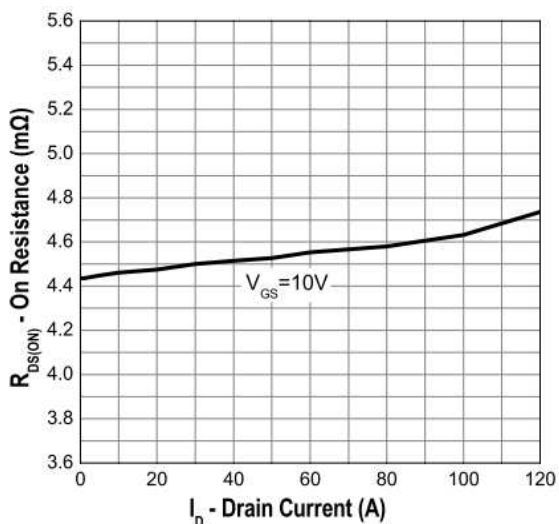
Gate Source On Resistance



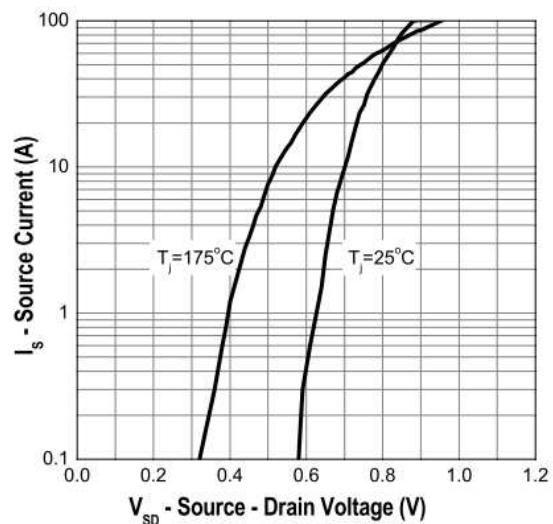
Drain-Source On Resistance



Drain-Source On-Resistance



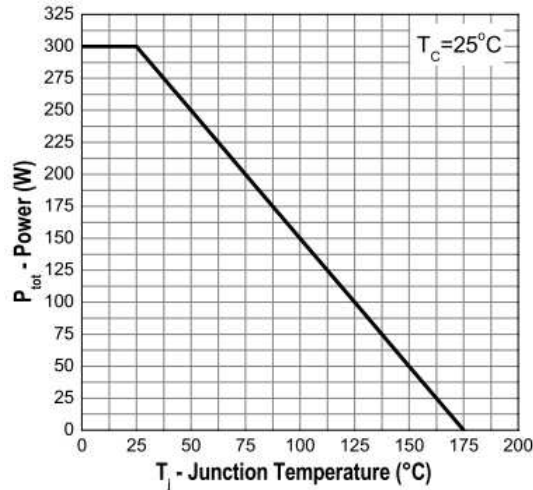
Source-Drain Diode Forward Voltage



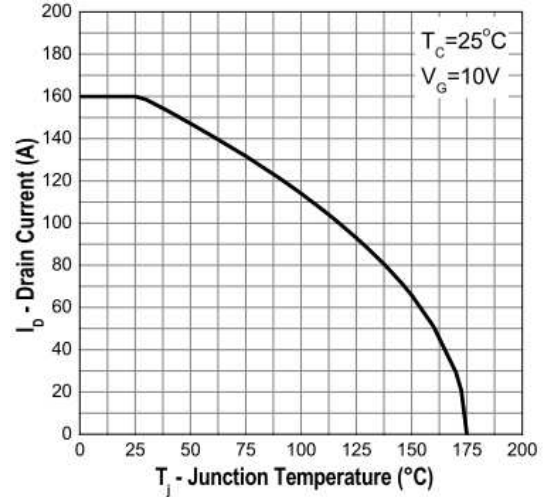
CHARACTERISTICS CURVES

($T_A = 25^\circ\text{C}$ unless otherwise noted)

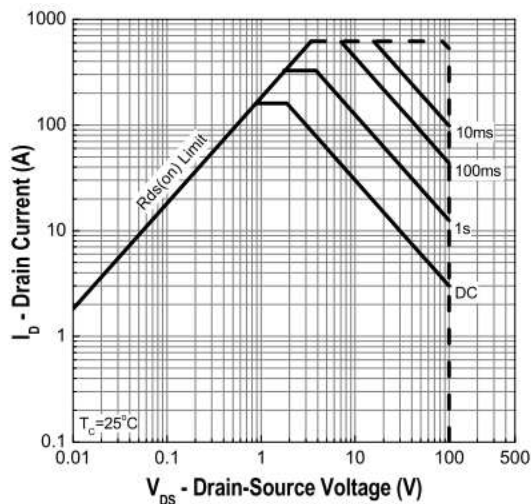
Power Derating



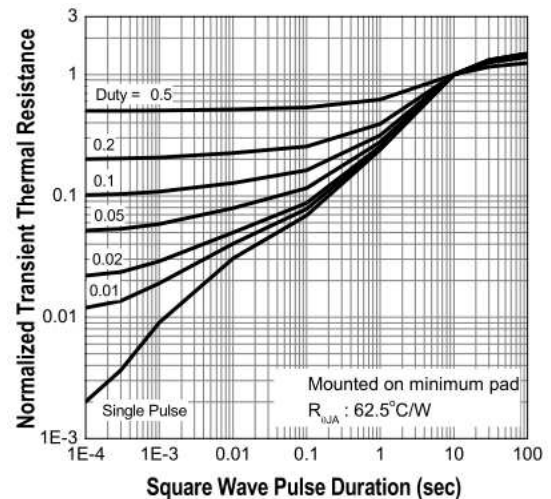
Drain Current vs. Junction Temperature



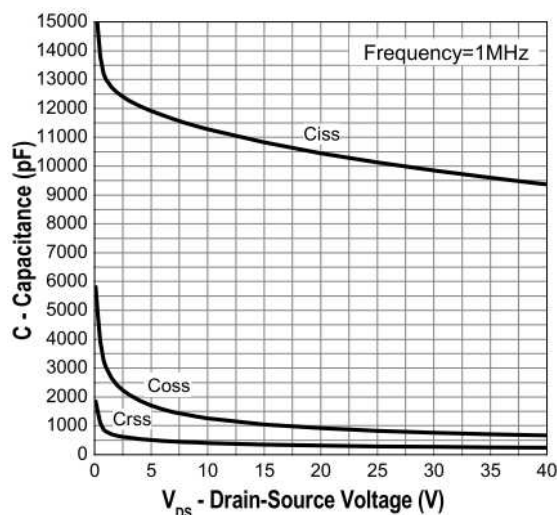
Safe Operation Area



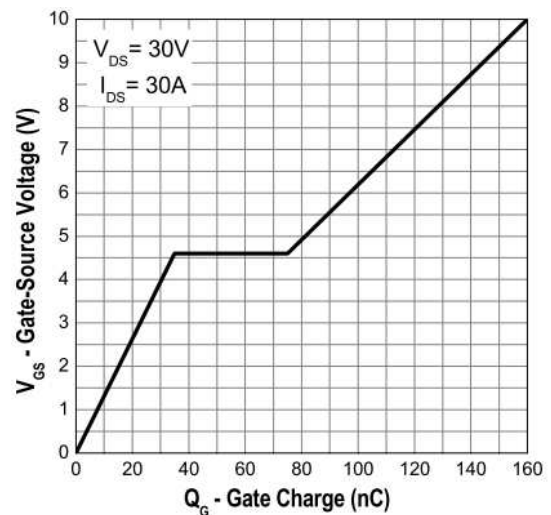
Transient Thermal Impedance



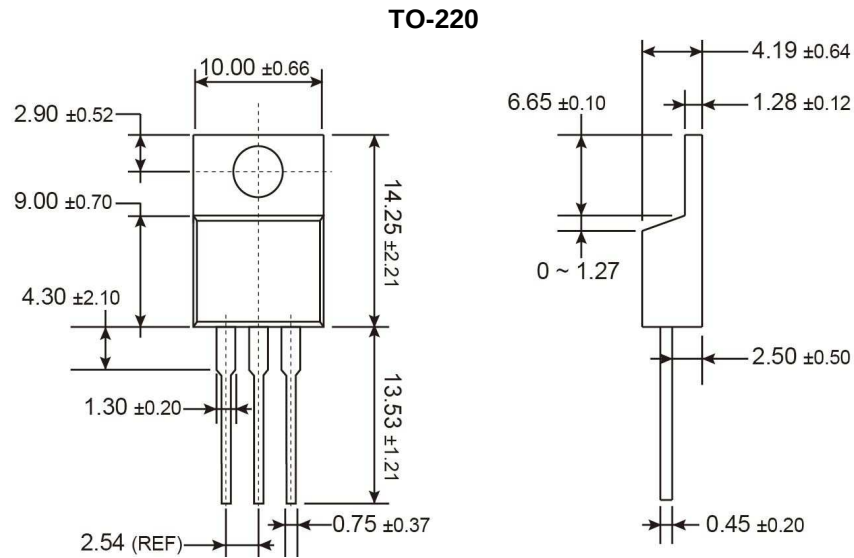
Capacitance



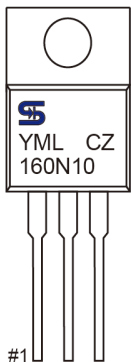
Gate Charge



PACKAGE OUTLINE DIMENSIONS (Unit: Millimeters)



Marking Diagram



Y = Year Code
M = Month Code for Halogen Free Product
O =Jan **P** =Feb **Q** =Mar **R** =Apr
S =May **T** =Jun **U** =Jul **V** =Aug
W =Sep **X** =Oct **Y** =Nov **Z** =Dec
L = Lot Code (1~9, A~Z)

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.