

TSM35N10CP

100V N-Channel Power MOSFET

TO-252
(DPAK)



Pin Definition:

1. Gate
2. Drain
3. Source

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (m Ω)	I_D (A)
100	37 @ $V_{GS}=10V$	32

Features

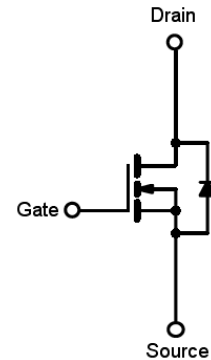
- Advanced Trench Technology
- Low $R_{DS(ON)}$ 37m Ω (Max.)
- Low gate charge typical @ 34nC (Typ.)
- Low C_{rss} typical @ 45pF (Typ.)

Ordering Information

Ordering code	Package	Packing
TSM35N10CP ROG	TO-252	2.5Kpcs / 13" Reel

Note: Halogen-free according to IEC 61249-2-21 definition

Block Diagram



N-Channel MOSFET

Absolute Maximum Rating ($T_a = 25^\circ C$ 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	$T_C=25^\circ C$	32	A
		$T_C=70^\circ C$	26	
		$T_A=25^\circ C$	5	
		$T_A=70^\circ C$	4	
Drain Current-Pulsed Note 1	I_{DM}	70	A	
Avalanche Current, L=0.1mH	I_{AS}, I_{AR}	35	A	
Avalanche Energy, L=0.1mH	E_{AS}, E_{AR}	61	mJ	
Maximum Power Dissipation	P_D	$T_C=25^\circ C$	83.3	W
		$T_C=70^\circ C$	53.3	
		$T_A=25^\circ C$	2	
		$T_A=70^\circ C$	1.3	
Storage Temperature Range	T_{STG}	-55 to +150	$^\circ C$	
Operating Junction Temperature Range	T_J	-55 to +150	$^\circ C$	

* Limited by maximum junction temperature

Thermal Performance

Parameter	Symbol	Limit	Unit
Thermal Resistance - Junction to Case	$R\theta_{JC}$	1.5	$^\circ C/W$
Thermal Resistance - Junction to Ambient	$R\theta_{JA}$	62	$^\circ C/W$

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

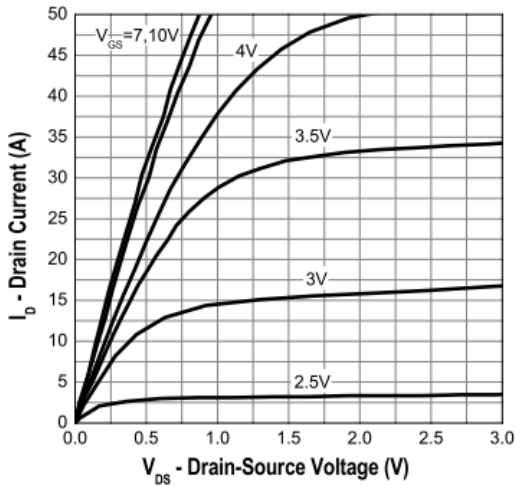
Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	BV_{DSS}	100	--	--	V
Drain-Source On-State Resistance	$V_{GS} = 10V, I_D = 10A$	$R_{DS(ON)}$	--	30	37	mΩ
	$V_{GS} = 4.5V, I_D = 10A$	$R_{DS(ON)}$	--	32	42	mΩ
Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	$V_{GS(TH)}$	1	2	3	V
Zero Gate Voltage Drain Current	$V_{DS} = 100V, V_{GS} = 0V$	I_{DSS}	--	--	1	μA
Gate Body Leakage	$V_{GS} = \pm 20V, V_{DS} = 0V$	I_{GSS}	--	--	±100	nA
Dynamic						
Total Gate Charge	$V_{DS} = 50V, I_D = 10A,$ $V_{GS} = 10V$	Q_g	--	34	--	nC
Gate-Source Charge		Q_{gs}	--	6	--	
Gate-Drain Charge		Q_{gd}	--	9	--	
Input Capacitance	$V_{DS} = 30V, V_{GS} = 0V,$ $f = 1.0MHz$	C_{iss}	--	1598	--	pF
Output Capacitance		C_{oss}	--	132	--	
Reverse Transfer Capacitance		C_{rss}	--	45	--	
Switching						
Turn-On Delay Time	$V_{GS} = 10V, V_{DS} = 50V,$ $R_G = 3\Omega$	$t_{d(on)}$	--	7	--	nS
Turn-On Rise Time		t_r	--	7	--	
Turn-Off Delay Time		$t_{d(off)}$	--	29	--	
Turn-Off Fall Time		t_f	--	7	--	
Drain-Source Diode Characteristics and Maximum Rating						
Drain-Source Diode Forward Voltage	$V_{GS}=0V, I_S=10A$	V_{SD}	--	0.7	--	V
Reverse Recovery Time	$I_S = 10A, T_J=25^\circ C$ $di/dt = 500A/\mu s$	t_{fr}	--	32	--	nS
Reverse Recovery Charge		Q_{fr}	--	200	--	nC

Notes:

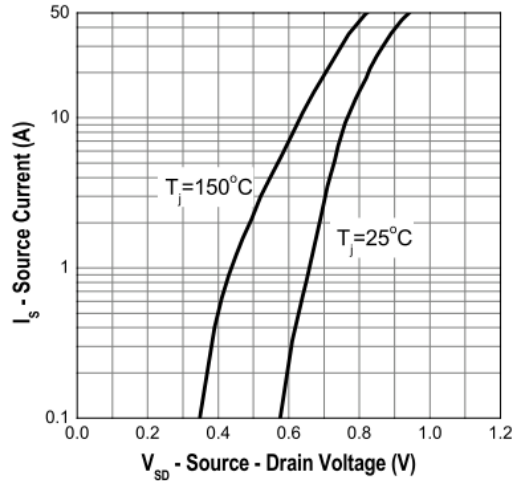
1. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
2. $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistances. The case-thermal reference is defined at the solder mounting surface of the drain pins. $R_{\theta JC}$ is guaranteed by design while $R_{\theta CA}$ is determined by the user's board design.

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

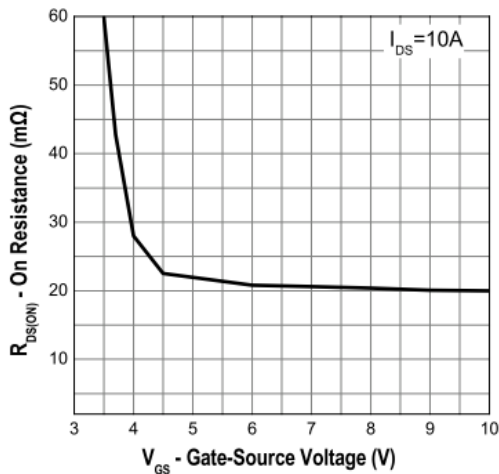
Output Characteristics



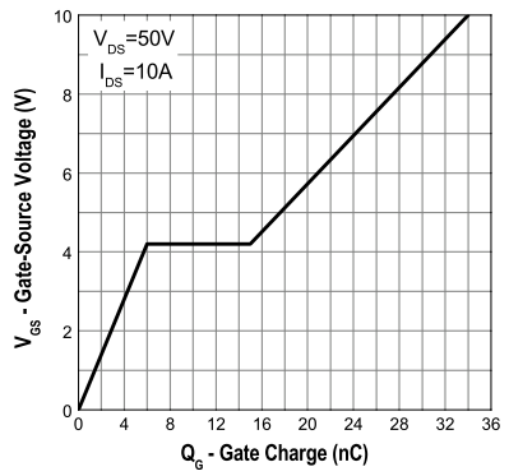
Transfer Characteristics



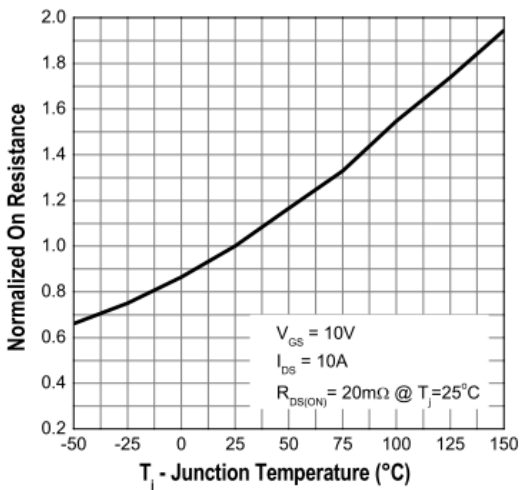
On-Resistance vs. Gate-Source Voltage



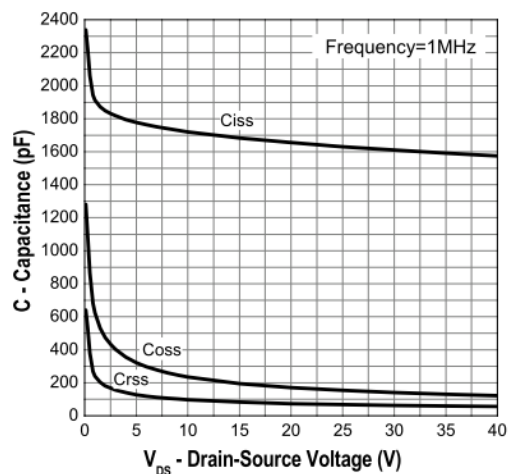
Gate Charge



On-Resistance vs. Junction Temperature

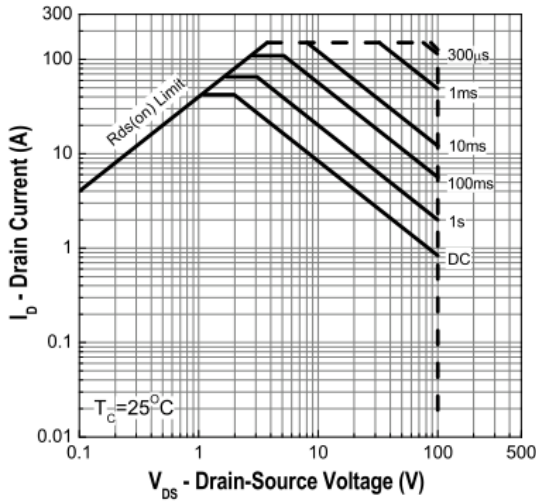


Capacitance

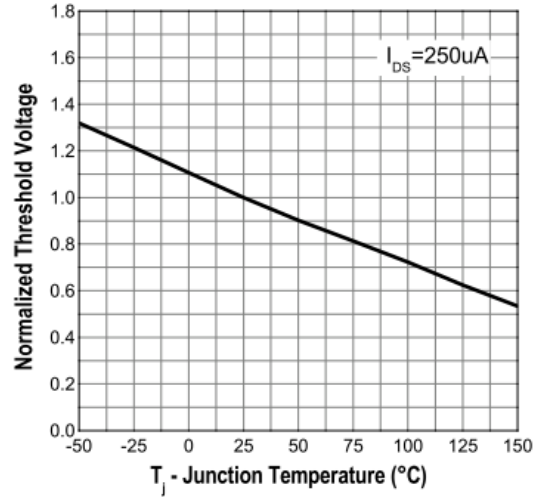


Electrical Characteristics Curve (Ta = 25°C, unless otherwise noted)

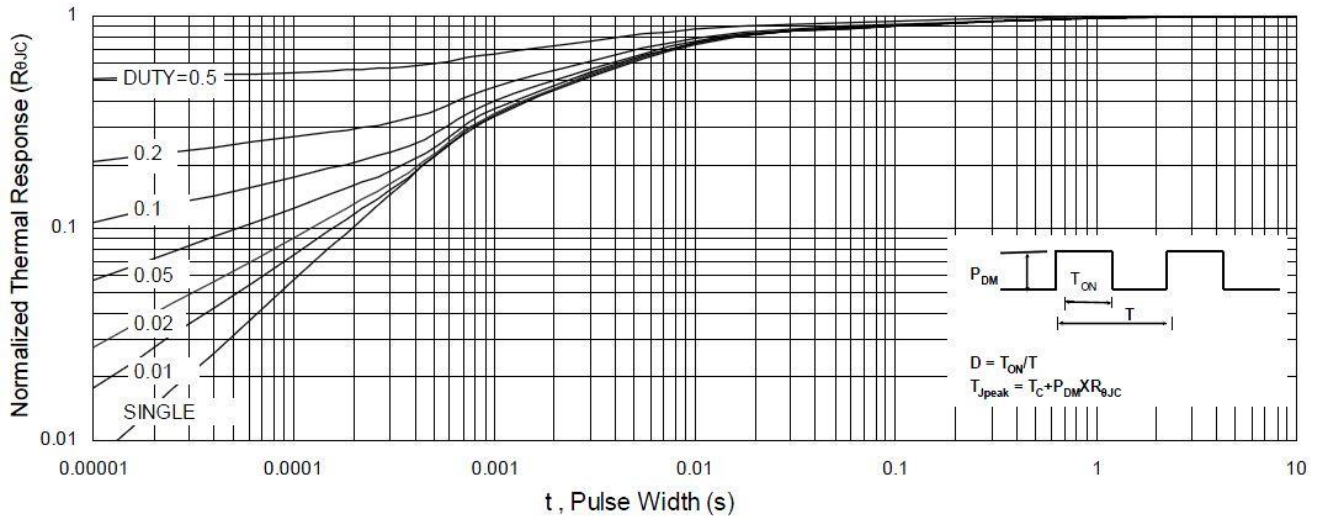
Maximum Safe Operating Area



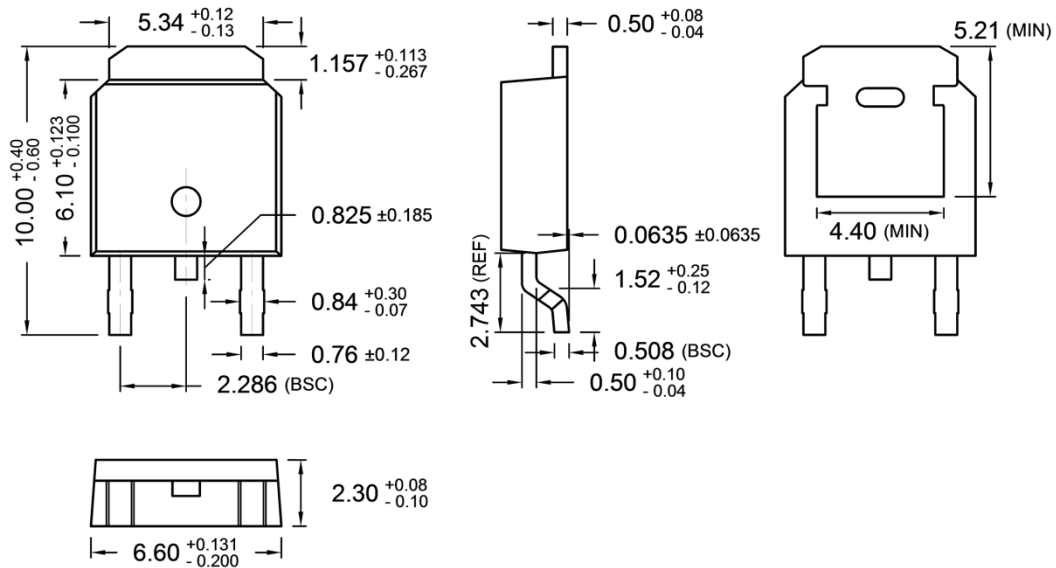
Threshold Voltage vs. Temperature



Normalized Thermal Transient Impedance, Junction-to-Ambient

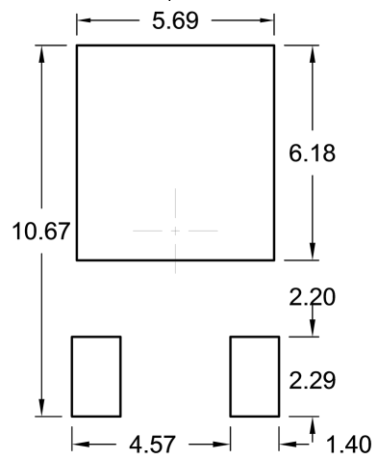


TO-252 Mechanical Drawing



Unit: Millimeters

SUGGESTED PAD LAYOUT (Unit: Millimeters)



Marking Diagram



- Y** = Year Code
- M** = Month Code
- 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.