

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)} (mΩ)	I _D (A)
100	37 @ V _{GS} =10V	32

Features

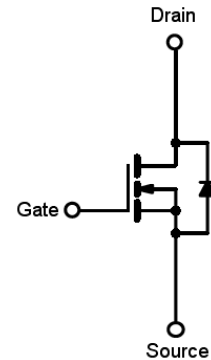
- Advanced Trench Technology
- Low R_{DS(ON)} 37mΩ (Max.)
- Low gate charge typical @ 34nC (Typ.)
- Low Crss typical @ 45pF (Typ.)

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°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	32	A
		T _C =70°C	26	
		T _A =25°C	5	
		T _A =70°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°C	83.3	W
		T _C =70°C	53.3	
		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	Rθ _{JC}	1.5	°C/W
Thermal Resistance - Junction to Ambient	Rθ _{JA}	62	°C/W

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

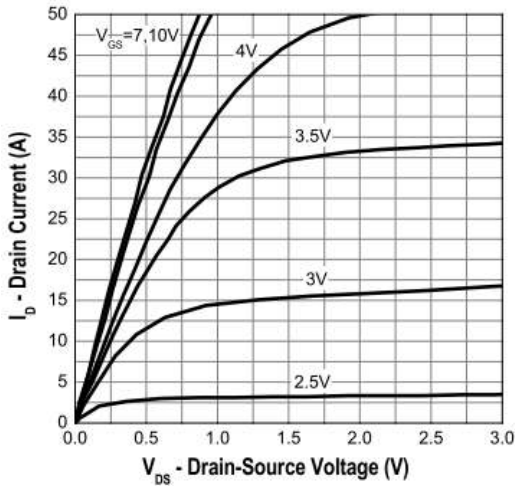
Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = 250uA	BV _{DSS}	100	--	--	V
Drain-Source On-State Resistance	V _{GS} = 10V, I _D = 10A	R _{DS(ON)}	--	30	37	mΩ
	V _{GS} = 4.5V, I _D = 10A	R _{DS(ON)}	--	32	42	mΩ
Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250uA	V _{GS(TH)}	1	2	3	V
Zero Gate Voltage Drain Current	V _{DS} = 100V, 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} = 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 = 3Ω	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°C	t _{fr}	--	32	--	nS
Reverse Recovery Charge		dI/dt = 500A/us	Q _{fr}	--	200	--

Notes:

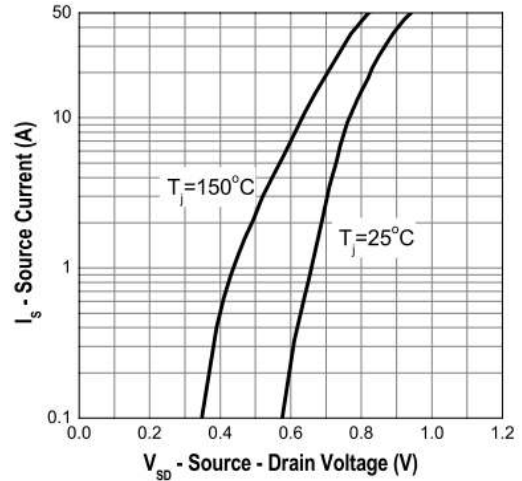
- Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
- R_{θJA} is the sum of the junction-to-case and case-to-ambient thermal resistances. The case-thermal reference is defined at the solder mounting surface of the drain pins. R_{θJC} is guaranteed by design while R_{θCA} is determined by the user's board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

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

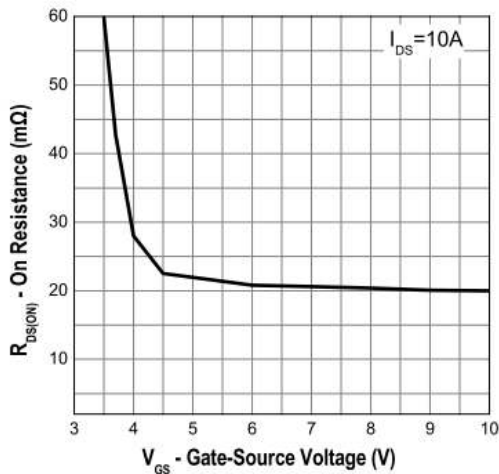
Output Characteristics



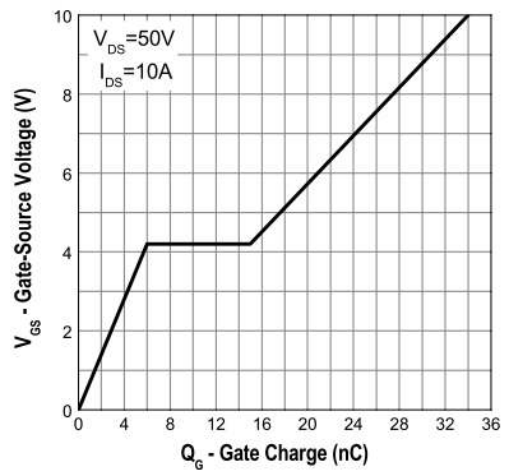
Transfer Characteristics



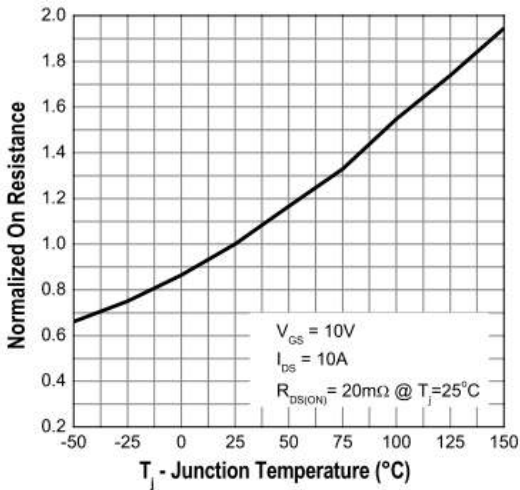
On-Resistance vs. Gate-Source Voltage



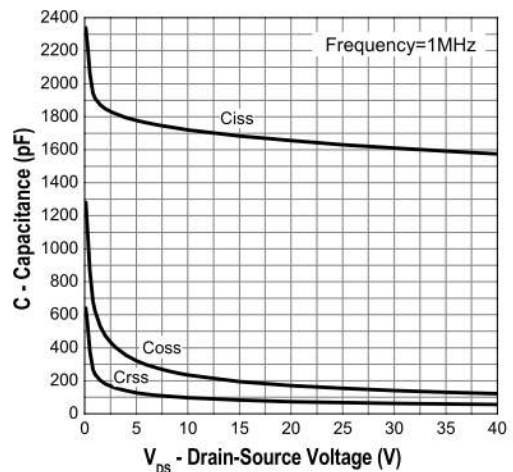
Gate Charge



On-Resistance vs. Junction Temperature

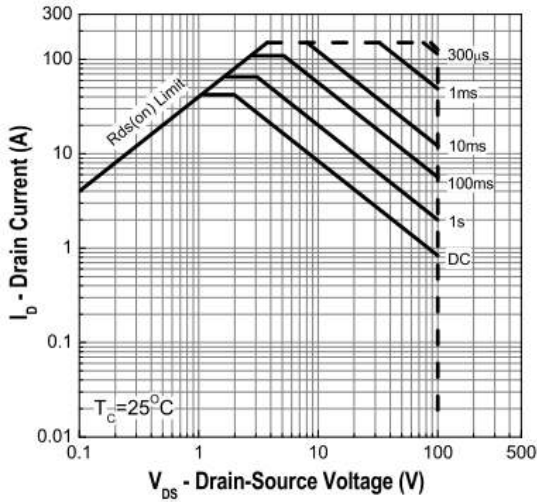


Capacitance

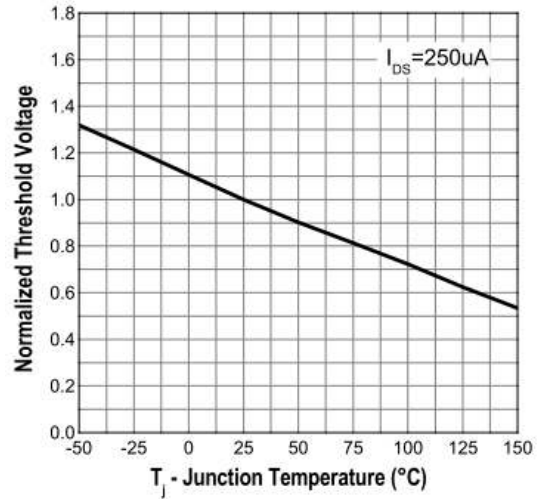


Electrical Characteristics Curve ($T_a = 25^\circ\text{C}$, unless otherwise noted)

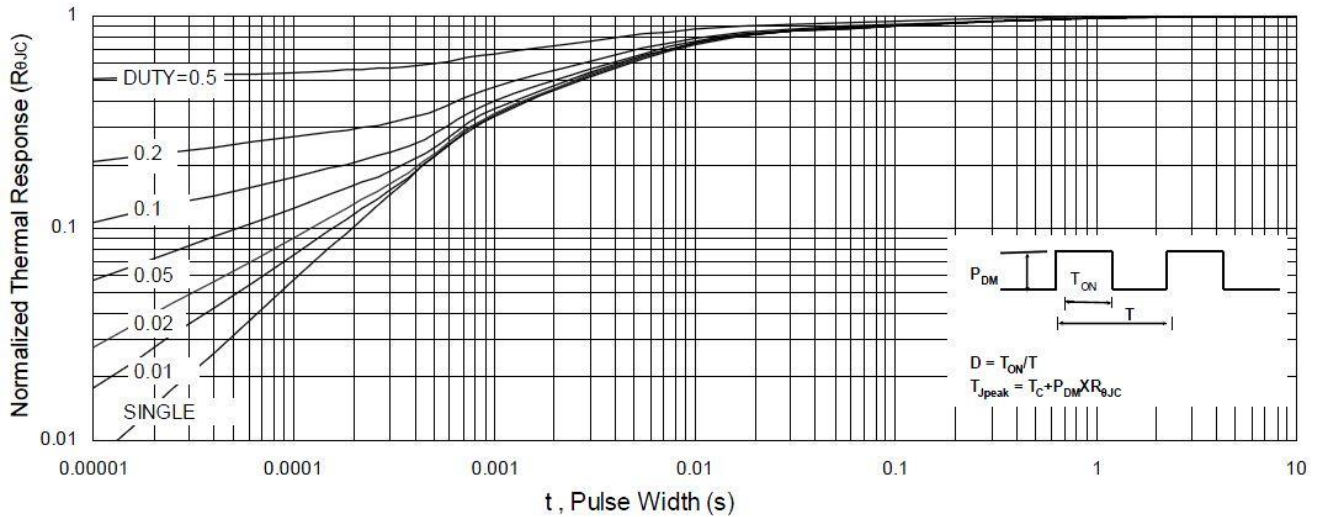
Maximum Safe Operating Area



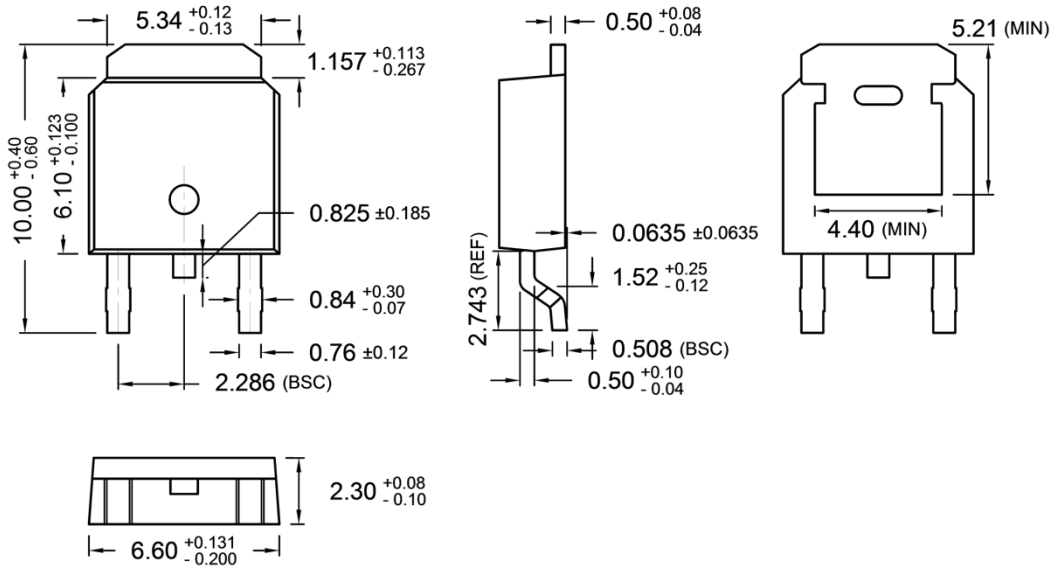
Threshold Voltage vs. Temperature



Normalized Thermal Transient Impedance, Junction-to-Ambient

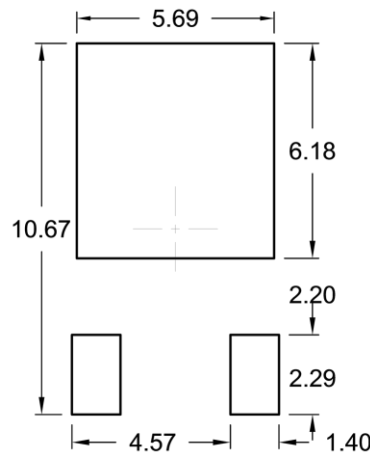


TO-252 Mechanical Drawing



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)

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