

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

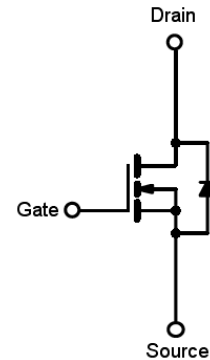
- Advanced Trench Technology
- Low $R_{DS(on)}$ 37m Ω (Max.)
- Low gate charge typical @ 34nC (Typ.)
- Low C_{rss} typical @ 45pF (Typ.)

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	$T_C=25^\circ\text{C}$	32
		$T_C=70^\circ\text{C}$	26
		$T_A=25^\circ\text{C}$	5
		$T_A=70^\circ\text{C}$	4
Drain Current-Pulsed Note 1	I_{DM}	70	A
Avalanche Current, $L=0.1\text{mH}$	I_{AS}, I_{AR}	35	A
Avalanche Energy, $L=0.1\text{mH}$	E_{AS}, E_{AR}	61	mJ
Maximum Power Dissipation	P_D	$T_C=25^\circ\text{C}$	83.3
		$T_C=70^\circ\text{C}$	53.3
		$T_A=25^\circ\text{C}$	2
		$T_A=70^\circ\text{C}$	1.3
Storage Temperature Range	T_{STG}	-55 to +150	$^\circ\text{C}$
Operating Junction Temperature Range	T_J	-55 to +150	$^\circ\text{C}$

* Limited by maximum junction temperature

Thermal Performance

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

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

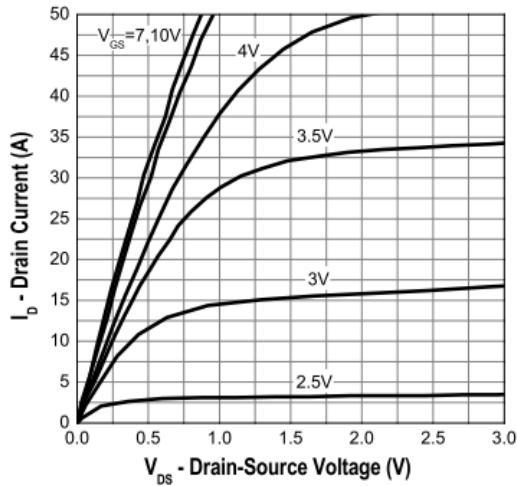
Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	BV_{DSS}	100	--	--	V
Drain-Source On-State Resistance	$V_{GS} = 10V, I_D = 10A$	$R_{DS(ON)}$	--	30	37	mΩ
	$V_{GS} = 4.5V, I_D = 10A$	$R_{DS(ON)}$	--	32	42	mΩ
Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	$V_{GS(TH)}$	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:

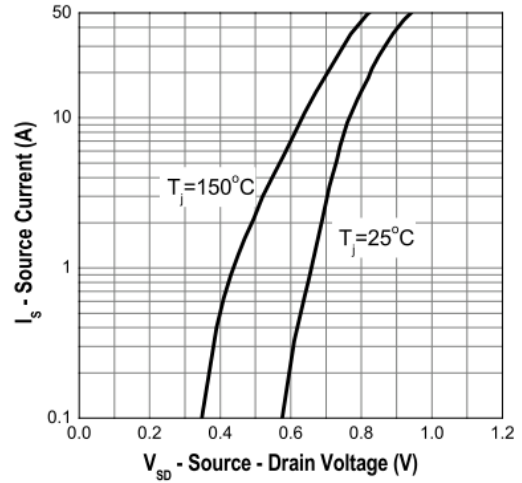
- Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
- $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistances. The case-thermal reference is defined at the solder mounting surface of the drain pins. $R_{\theta JC}$ is guaranteed by design while $R_{\theta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

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

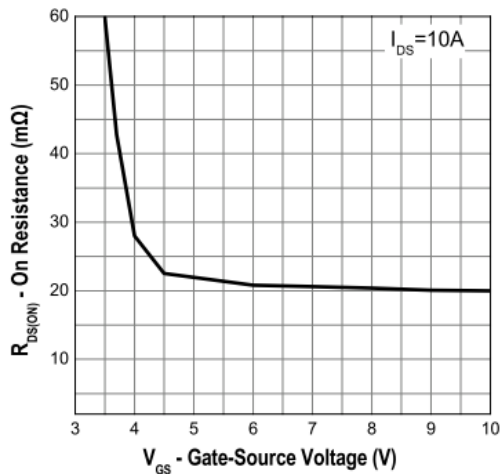
Output Characteristics



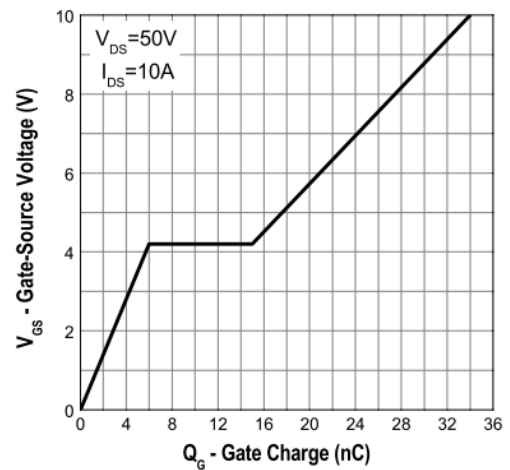
Transfer Characteristics



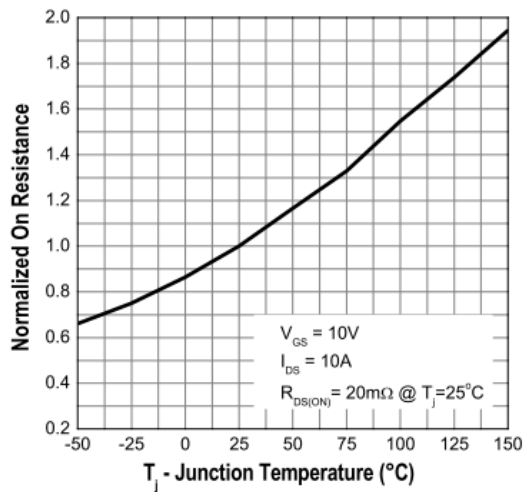
On-Resistance vs. Gate-Source Voltage



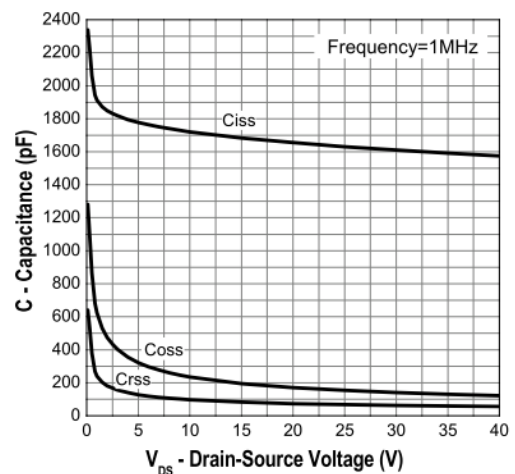
Gate Charge



On-Resistance vs. Junction Temperature

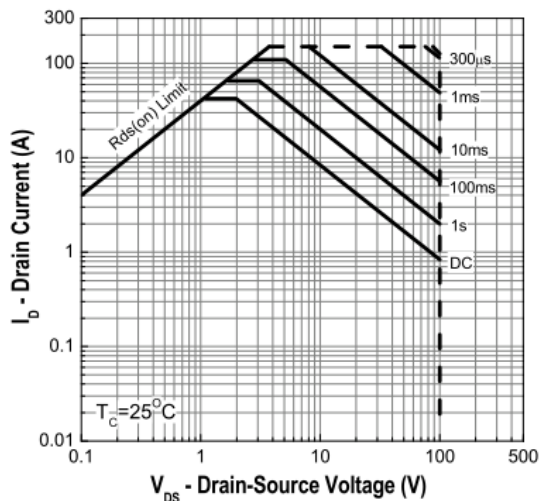


Capacitance

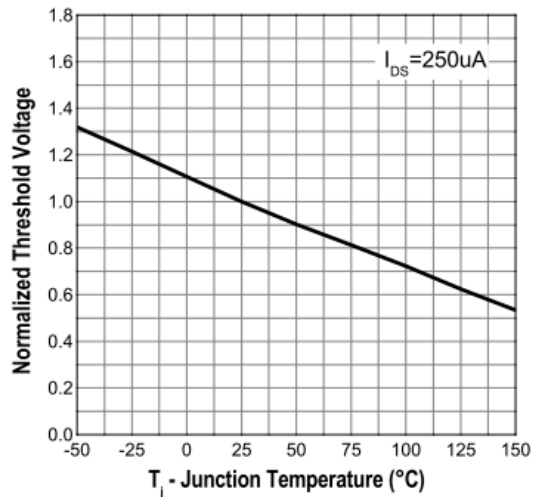


Electrical Characteristics Curve (Ta = 25°C, unless otherwise noted)

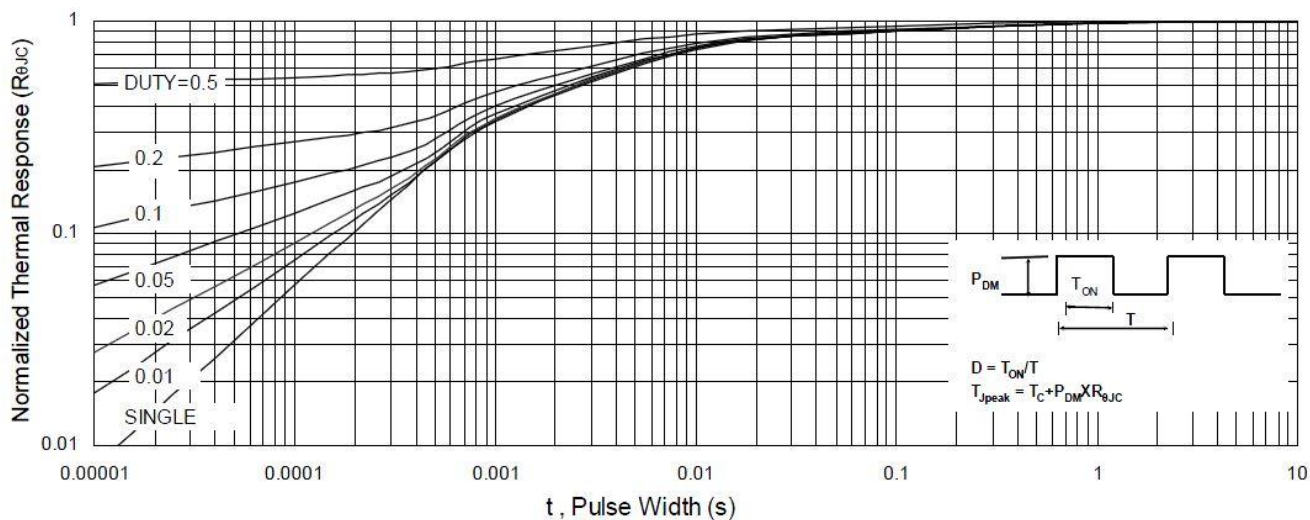
Maximum Safe Operating Area



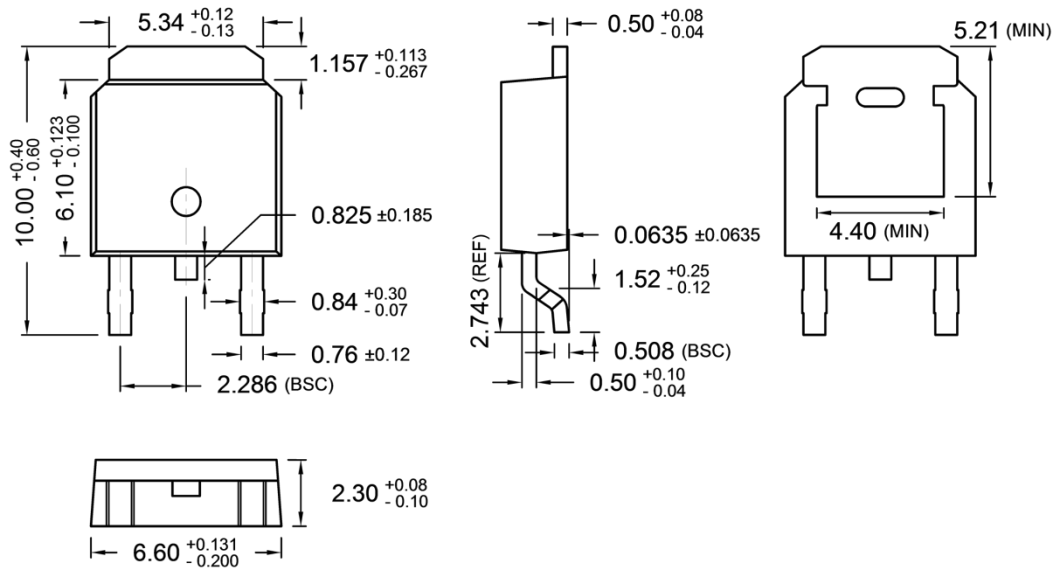
Threshold Voltage vs. Temperature



Normalized Thermal Transient Impedance, Junction-to-Ambient

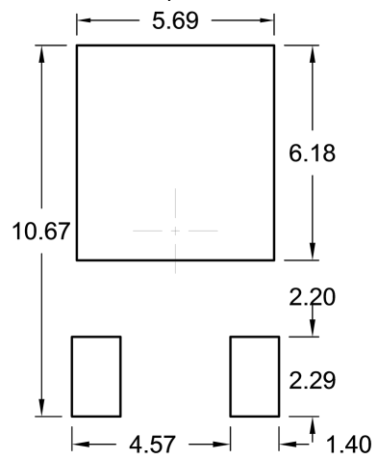


TO-252 Mechanical Drawing



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)

TSM35N10CP

100V N-Channel Power MOSFET

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