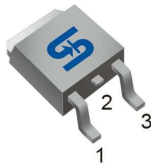




TO-252  
(DPAK)



**Pin Definition:**

1. Gate
2. Drain
3. Source

**PRODUCT SUMMARY**

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

**Features**

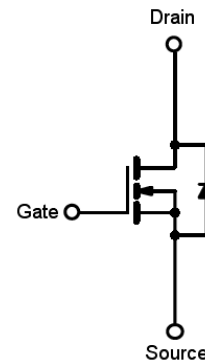
- Advanced Trench Technology
- Low  $R_{DS(ON)}$  37m $\Omega$  (Max.)
- Low gate charge typical @ 34nC (Typ.)
- Low  $C_{rss}$  typical @ 45pF (Typ.)

**Ordering Information**

Part No.	Package	Packing
TSM35N10CP ROG	TO-252	2.5Kpcs / 13" Reel

Note: "G" denote for Halogen Free Product

**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	$V_{GS}$	$\pm 20$	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)

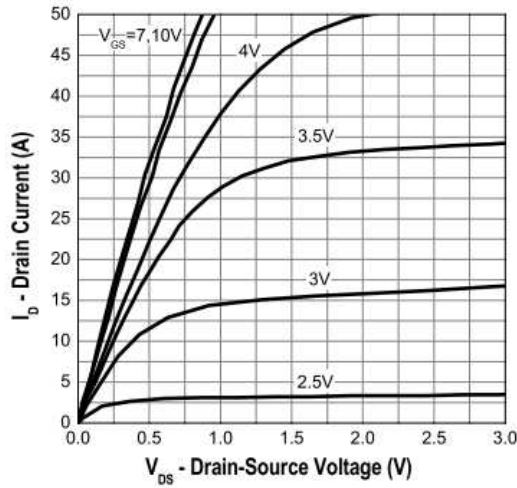
Parameter	Conditions	Symbol	Min	Typ	Max	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250uA	BV <sub>DSS</sub>	100	--	--	V
Drain-Source On-State Resistance	V <sub>GS</sub> = 10V, I <sub>D</sub> = 10A	R <sub>DS(ON)</sub>	--	30	37	mΩ
	V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 10A	R <sub>DS(ON)</sub>	--	32	42	mΩ
Gate Threshold Voltage	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250uA	V <sub>GS(TH)</sub>	1	2	3	V
Zero Gate Voltage Drain Current	V <sub>DS</sub> = 100V, V <sub>GS</sub> = 0V	I <sub>DSS</sub>	--	--	1	uA
Gate Body Leakage	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V	I <sub>GSS</sub>	--	--	±100	nA
<b>Dynamic</b>						
Total Gate Charge	V <sub>DS</sub> = 50V, I <sub>D</sub> = 10A, V <sub>GS</sub> = 10V	Q <sub>g</sub>	--	34	--	nC
Gate-Source Charge		Q <sub>gs</sub>	--	6	--	
Gate-Drain Charge		Q <sub>gd</sub>	--	9	--	
Input Capacitance	V <sub>DS</sub> = 30V, V <sub>GS</sub> = 0V, f = 1.0MHz	C <sub>iss</sub>	--	1598	--	pF
Output Capacitance		C <sub>oss</sub>	--	132	--	
Reverse Transfer Capacitance		C <sub>rss</sub>	--	45	--	
<b>Switching</b>						
Turn-On Delay Time	V <sub>GS</sub> = 10V, V <sub>DS</sub> = 50V, R <sub>G</sub> = 3Ω	t <sub>d(on)</sub>	--	7	--	nS
Turn-On Rise Time		t <sub>r</sub>	--	7	--	
Turn-Off Delay Time		t <sub>d(off)</sub>	--	29	--	
Turn-Off Fall Time		t <sub>f</sub>	--	7	--	
<b>Drain-Source Diode Characteristics and Maximum Rating</b>						
Drain-Source Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =10A	V <sub>SD</sub>	--	0.7	--	V
Reverse Recovery Time	I <sub>S</sub> = 10A, T <sub>J</sub> =25°C	t <sub>fr</sub>	--	32	--	nS
Reverse Recovery Charge		dI/dt = 500A/us	Q <sub>fr</sub>	--	200	--

**Notes:**

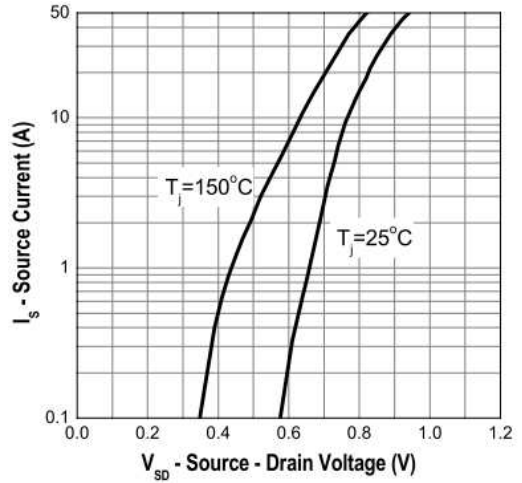
- Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
- R<sub>θJA</sub> is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. R<sub>θJC</sub> is guaranteed by design while R<sub>θCA</sub> is determined by the user's board design. R<sub>θJA</sub> shown below for single device operation on FR-4 in still air

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

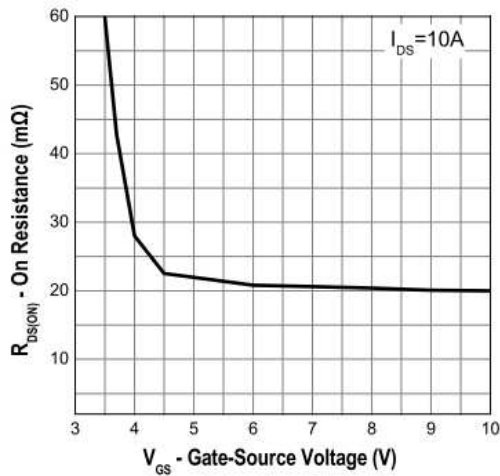
**Output Characteristics**



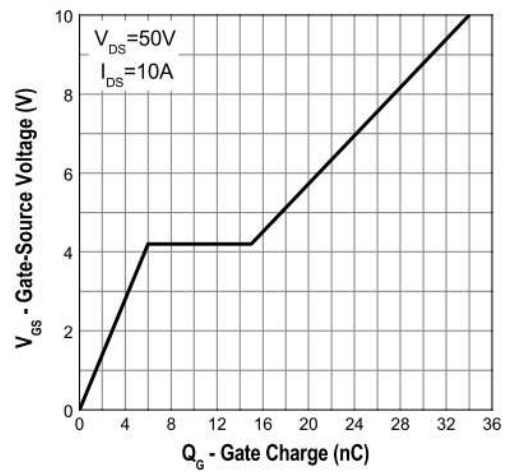
**Transfer Characteristics**



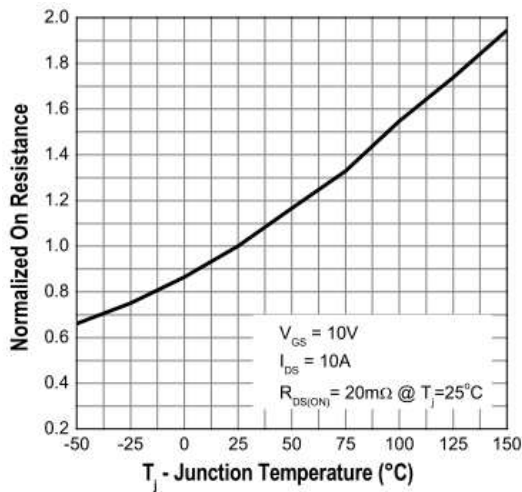
**On-Resistance vs. Gate-Source Voltage**



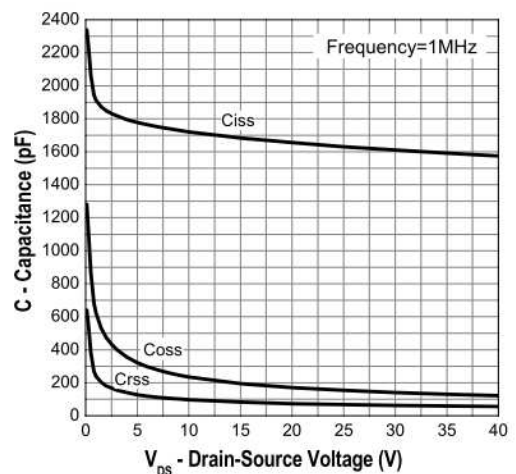
**Gate Charge**



**On-Resistance vs. Junction Temperature**

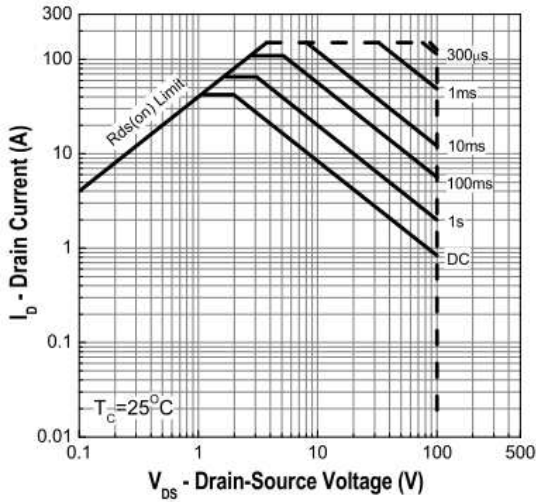


**Capacitance**

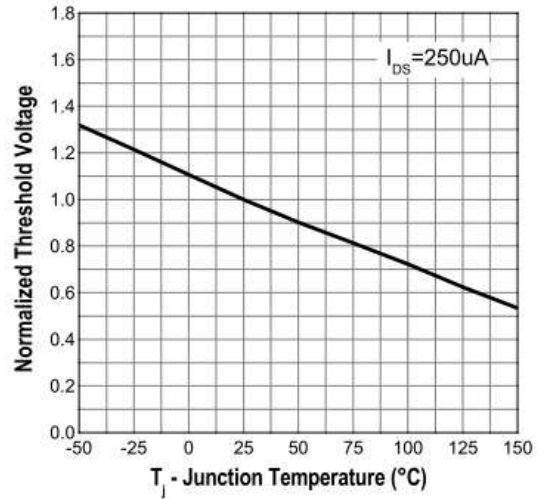


**Electrical Characteristics Curve** ( $T_a = 25^\circ\text{C}$ , unless otherwise noted)

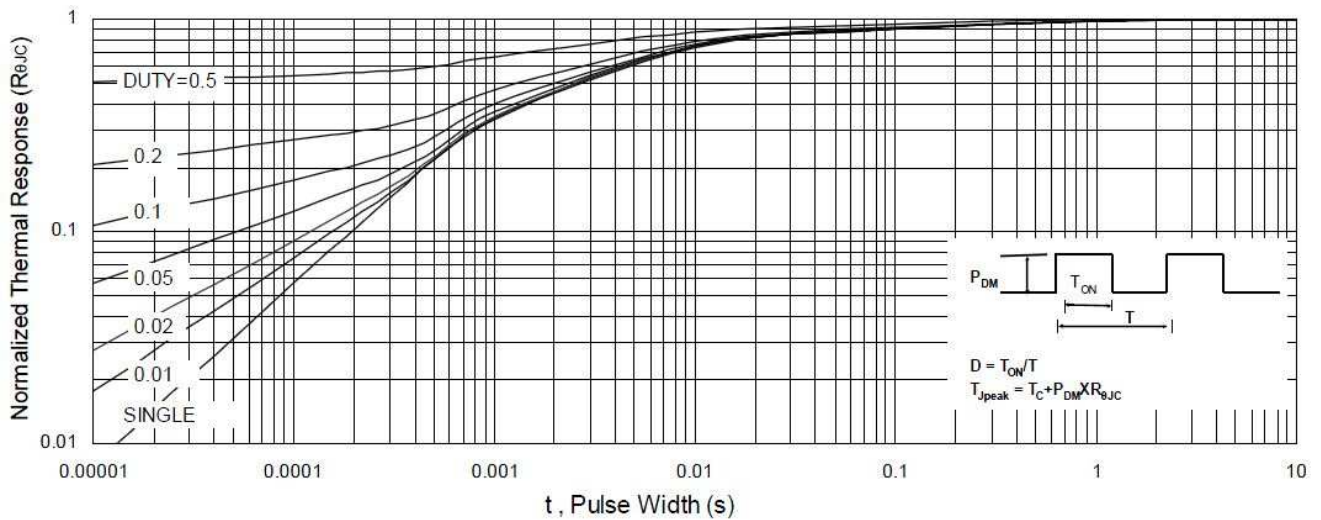
**Maximum Safe Operating Area**



**Threshold Voltage vs. Temperature**

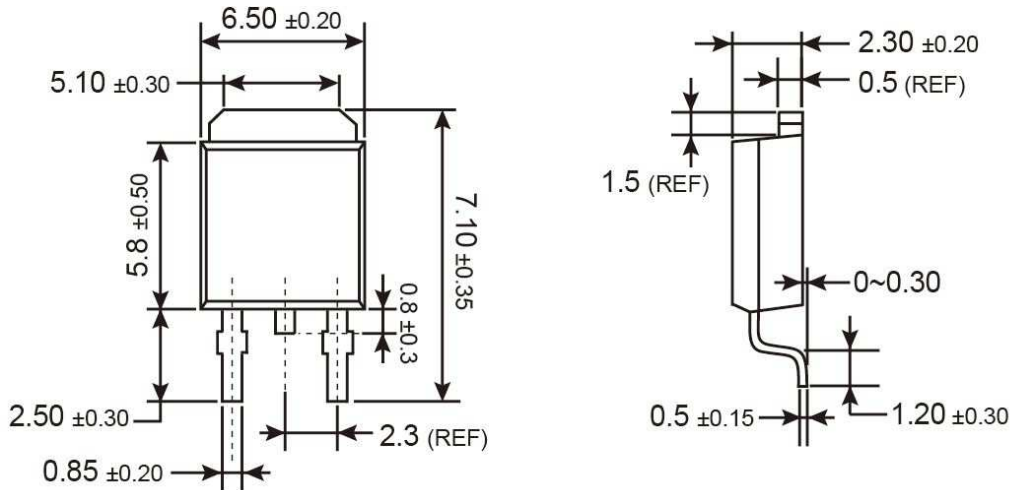


**Normalized Thermal Transient Impedance, Junction-to-Ambient**



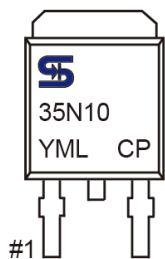


### TO-252 Mechanical Drawing



Unit: Millimeters

### 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

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