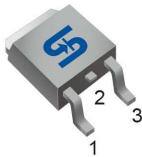


TO-252
(DPAK)



Pin Definition:

1. Gate
2. Drain
3. Source

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (m Ω)	I_D (A)
60	65 @ $V_{GS} = 10V$	10
	80 @ $V_{GS} = 5V$	10
	110 @ $V_{GS} = 4V$	9

Features

- Advance Trench Process Technology
- High Density Cell Design for Ultra Low On-resistance

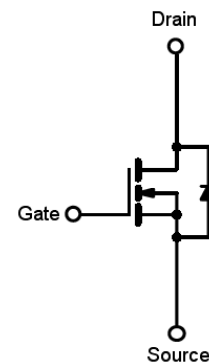
Application

- Load Switch
- PA Switch

Ordering Information

Part No.	Package	Packing
TSM10N06CP RO	TO-252	2.5Kpcs / 13" Reel

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}	60	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	10	A
Pulsed Drain Current	I_{DM}	50	A
Continuous Source Current (Diode Conduction) ^{a,b}	I_S	10	A
Total Power Dissipation @ $T_C=25C$	P_{DTOT}	45	W
Operating Junction Temperature	T_J	+150	$^\circ C$
Operating Junction and Storage Temperature Range	T_J, T_{STG}	- 55 to +150	$^\circ C$

Thermal Performance

Parameter	Symbol	Limit	Unit
Junction to Case Thermal Resistance	$R_{\theta JC}$	2.78	$^\circ C/W$
Junction to Ambient Thermal Resistance (PCB mounted)	$R_{\theta JA}$	50	$^\circ C/W$

Notes:

- a. Pulse width limited by the Maximum junction temperature
- b. Surface Mounted on FR4 Board, $t \leq 10$ sec.

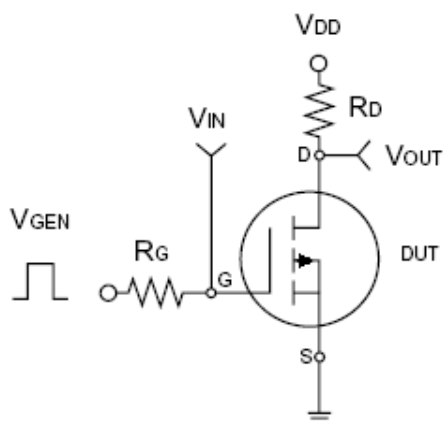
Electrical Specifications (Ta = 25°C unless otherwise noted)

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	BV_{DSS}	60	--	--	V
Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	$V_{GS(TH)}$	1	--	3	V
Gate Body Leakage	$V_{GS} = \pm 20V, V_{DS} = 0V$	I_{GSS}	--	--	± 100	nA
Zero Gate Voltage Drain Current	$V_{DS} = 60V, V_{GS} = 0V$	I_{DSS}	--	--	2	μA
Drain-Source On-State Resistance	$V_{GS} = 10V, I_D = 10A$	$R_{DS(ON)}$	--	--	65	m Ω
	$V_{GS} = 5V, I_D = 10A$		--	--	80	
	$V_{GS} = 4V, I_D = 9A$		--	--	110	
Forward Transconductance	$V_{DS} = 25V, I_D = 6A$	g_{fs}	--	13	--	S
Diode Forward Voltage	$I_S = 2A, V_{GS} = 0V$	V_{SD}	--	0.9	1.2	V
Dynamic²						
Total Gate Charge	$V_{DS} = 30V, I_D = 9A, V_{GS} = 4.5V$	Q_g	--	10.5	16	nC
Gate-Source Charge		Q_{gs}	--	3.5	--	
Gate-Drain Charge		Q_{gd}	--	4.2	--	
Input Capacitance	$V_{DS} = 30V, V_{GS} = 0V, f = 1.0MHz$	C_{iss}	--	1100	--	pF
Output Capacitance		C_{oss}	--	90	--	
Reverse Transfer Capacitance		C_{rss}	--	55	--	
Switching^{2,3}						
Turn-On Delay Time	$V_{DD} = 30V, R_L = 5.4\Omega, I_D = 9A, V_{GEN} = 10V, R_G = 1\Omega$	$t_{d(on)}$	--	10	15	nS
Turn-On Rise Time		t_r	--	15	25	
Turn-Off Delay Time		$t_{d(off)}$	--	25	40	
Turn-Off Fall Time		t_f	--	10	15	

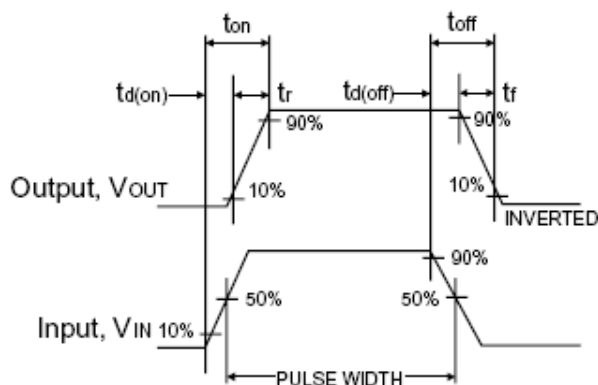
Notes 1: Pulse test: $PW \leq 300\mu S$, duty cycle $\leq 2\%$

Notes 2: For DESIGN AID ONLY, not subject to production testing.

Notes 3: Switching time is essentially independent of operating temperature.



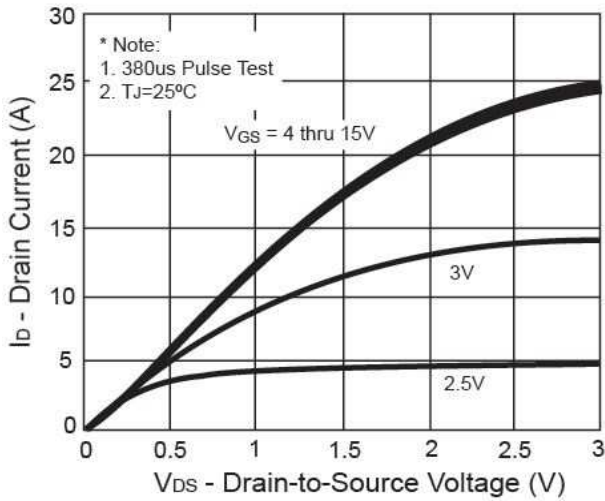
Switching Test Circuit



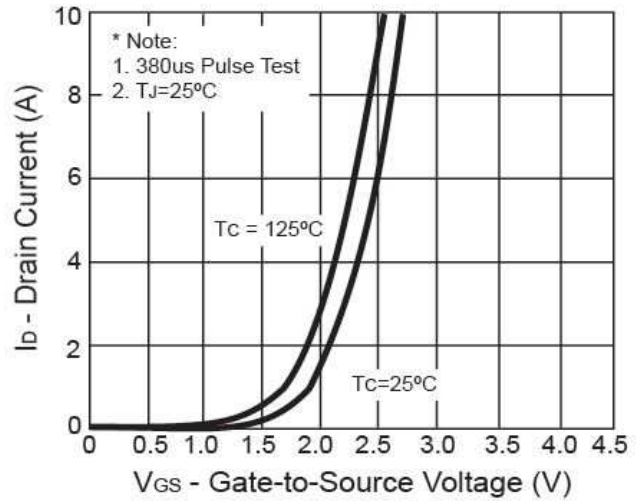
Switchin Waveforms

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

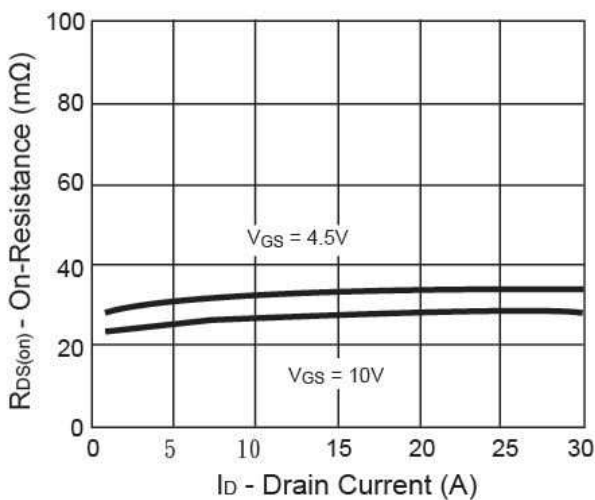
Output Characteristics



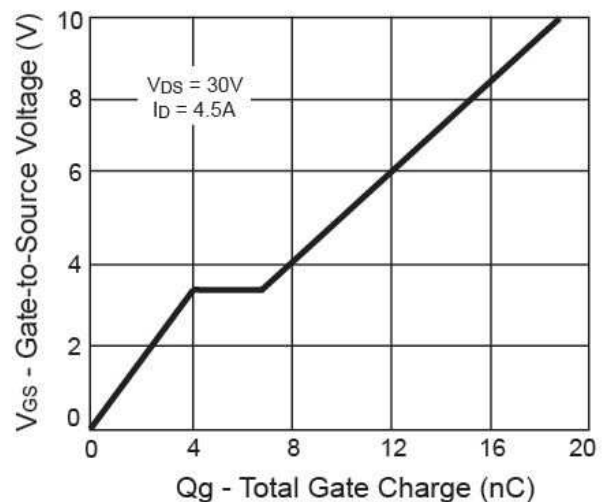
Transfer Characteristics



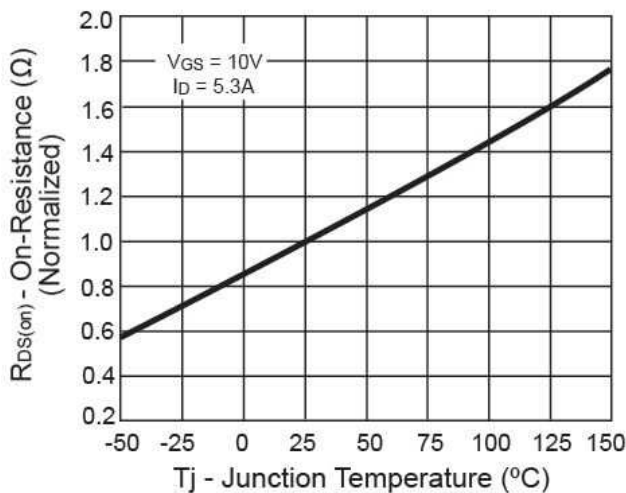
On-Resistance vs. Drain Current



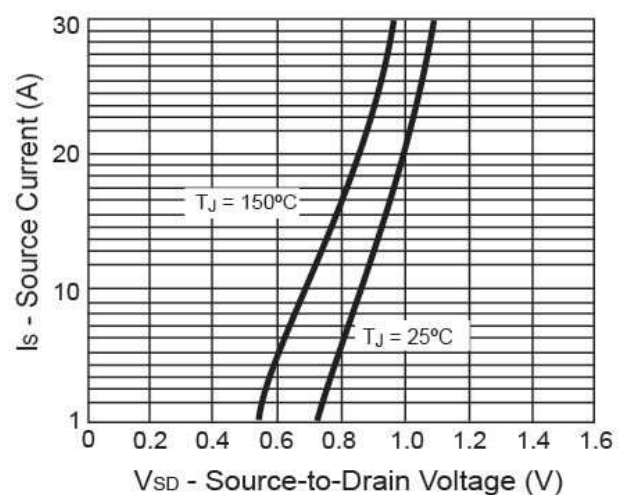
Gate Charge



On-Resistance vs. Junction Temperature

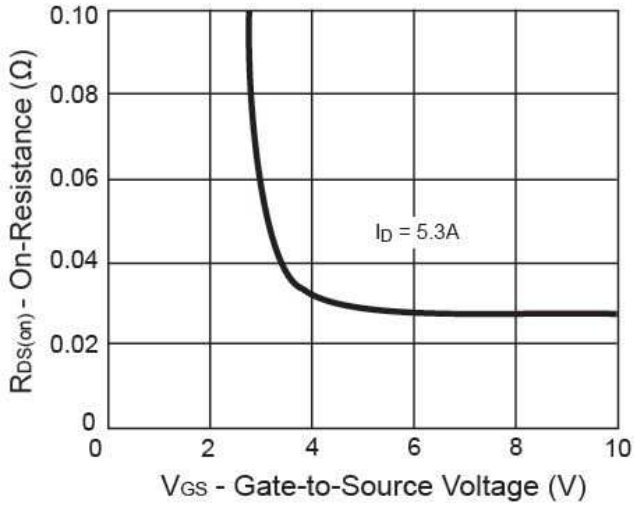


Source-Drain Diode Forward Voltage

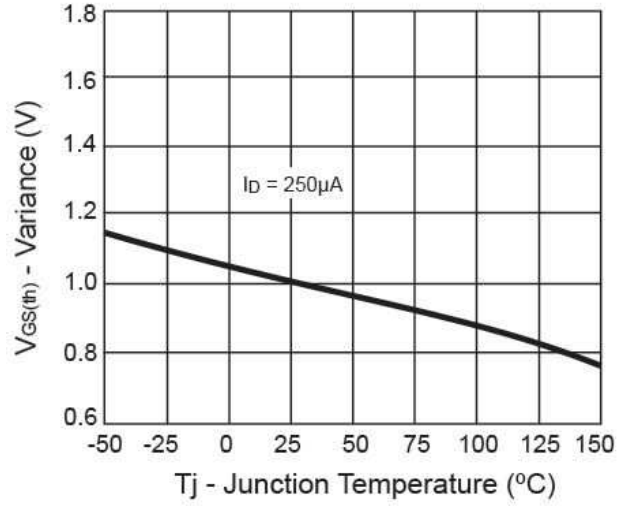


Electrical Characteristics Curve ($T_a = 25^\circ\text{C}$, unless otherwise noted)

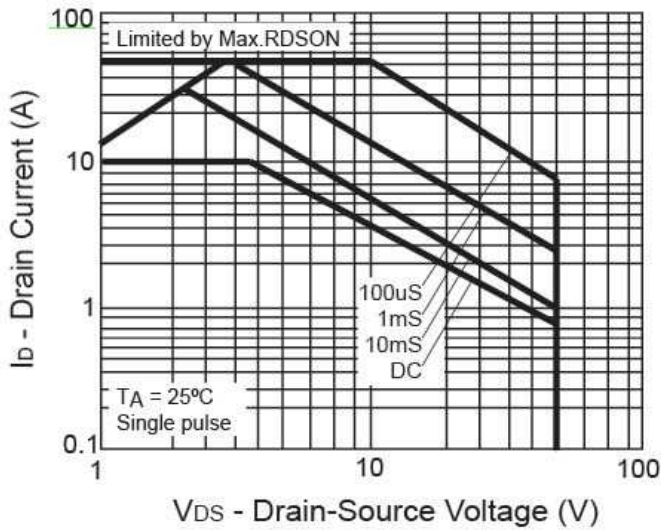
On-Resistance vs. Gate-Source Voltage



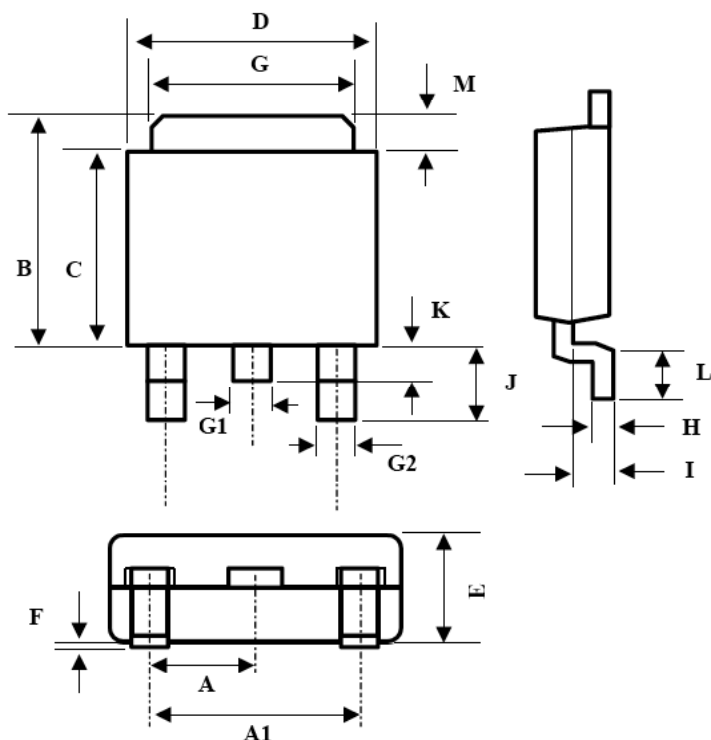
Threshold Voltage



Maximum Safe Operating Area



TO-252 Mechanical Drawing



TO-252 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.3BSC		0.09BSC	
A1	4.6BSC		0.18BSC	
B	6.80	7.20	0.268	0.283
C	5.40	5.60	0.213	0.220
D	6.40	6.65	0.252	0.262
E	2.20	2.40	0.087	0.094
F	0.00	0.20	0.000	0.008
G	5.20	5.40	0.205	0.213
G1	0.61	0.78	0.024	0.030
G2	0.51	0.71	0.020	0.028
H	0.35	0.65	0.014	0.026
I	0.90	1.50	0.035	0.059
J	2.20	2.80	0.087	0.110
K	0.50	1.10	0.020	0.043
L	0.90	1.50	0.035	0.059
M	1.30	1.70	0.051	0.67

Marking Diagram



- Y** = Year Code
- M** = Month Code
(**A**=Jan, **B**=Feb, **C**=Mar, **D**=Apr, **E**=May, **F**=Jun, **G**=Jul, **H**=Aug, **I**=Sep, **J**=Oct, **K**=Nov, **L**=Dec)
- L** = Lot Code

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