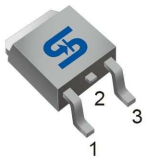
TSM10N06

60V N-Channel MOSFET

TO-252 (DPAK)



Pin Definition:
1. Gate
2. Drain
3. Source

PRODUCT SUMMARY

V_{DS} (V)	R_{DSON} (mΩ)	I_D (A)
60	65 @ V_{GS} = 10V	10
	80 @ V_{GS} = 5V	10
	110 @ V_{GS} = 4V	9

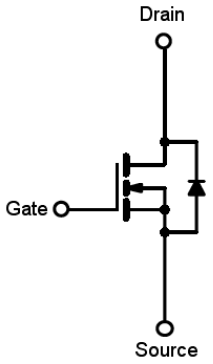
Features

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

Application

- Load Switch
- PA Switch

Block Diagram



N-Channel MOSFET

Ordering Information

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

Absolute Maximum Rating (T_A = 25°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	°C
Operating Junction and Storage Temperature Range	T_J, T_{STG}	- 55 to +150	°C

Thermal Performance

Parameter	Symbol	Limit	Unit
Junction to Case Thermal Resistance	$R\Theta_{JC}$	2.78	°C/W
Junction to Ambient Thermal Resistance (PCB mounted)	$R\Theta_{JA}$	50	°C/W

Notes:

a. Pulse width limited by the Maximum junction temperature

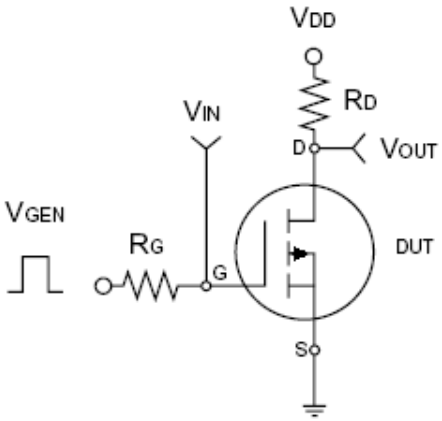
b. Surface Mounted on FR4 Board, t ≤ 10 sec.

TSM10N06
60V N-Channel MOSFET

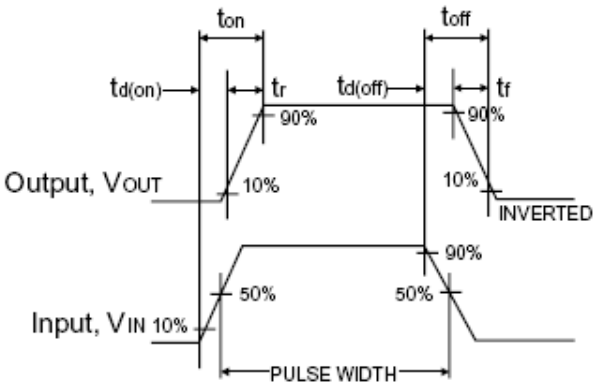
Electrical Specifications (Ta = 25°C unless otherwise noted)

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 250uA	BV_{DSS}	60	--	--	V
Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	$V_{GS(TH)}$	1	--	3	V
Gate Body Leakage	V_{GS} = ±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	mΩ
	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
Dynamic[2]						
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 = 5.4Ω, I_D = 9A, V_{GEN} = 10V, R_G = 1Ω	$t_{d(on)}$	--	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 ≤300μS, duty cycle ≤2%
Notes 2: For DESIGN AID ONLY, not subject to production testing.
Notes 3: Switching time is essentially independent of operating temperature.



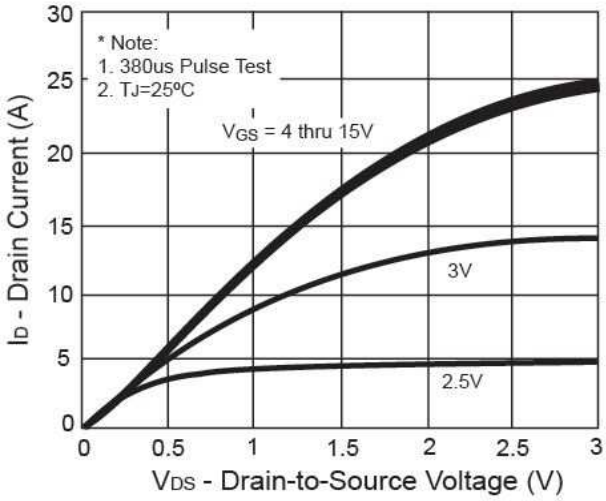
Switching Test Circuit



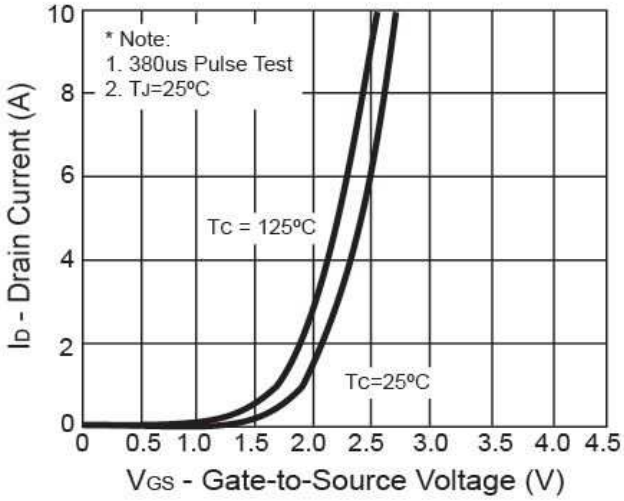
Switchin Waveforms

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

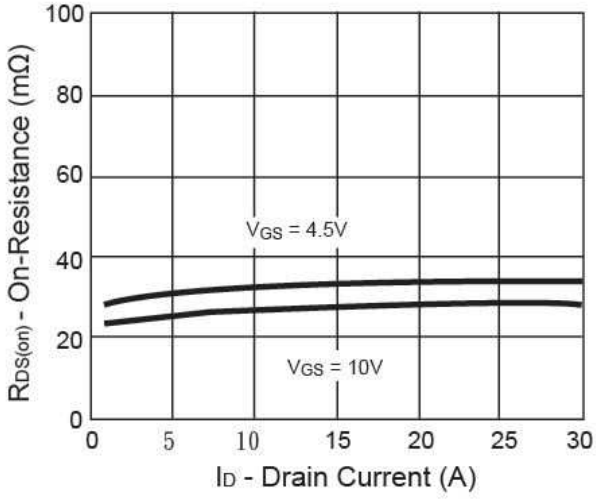
Output Characteristics



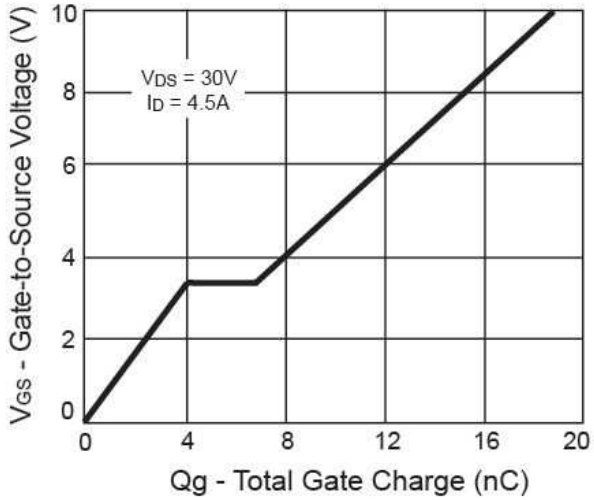
Transfer Characteristics



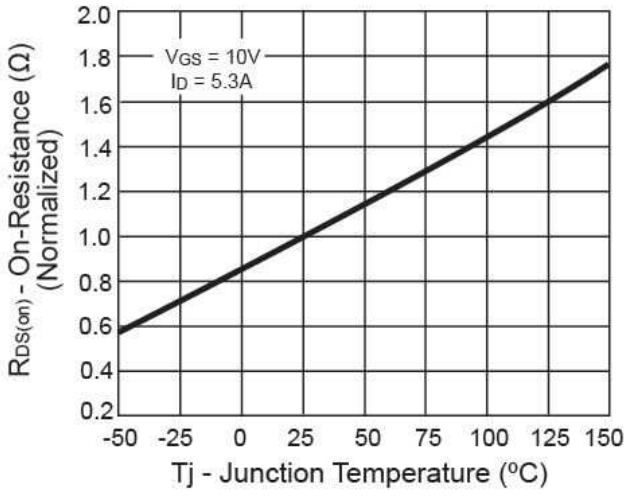
On-Resistance vs. Drain Current



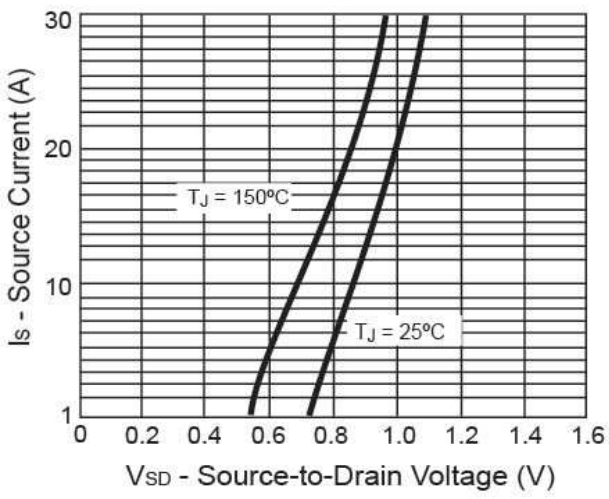
Gate Charge



On-Resistance vs. Junction Temperature

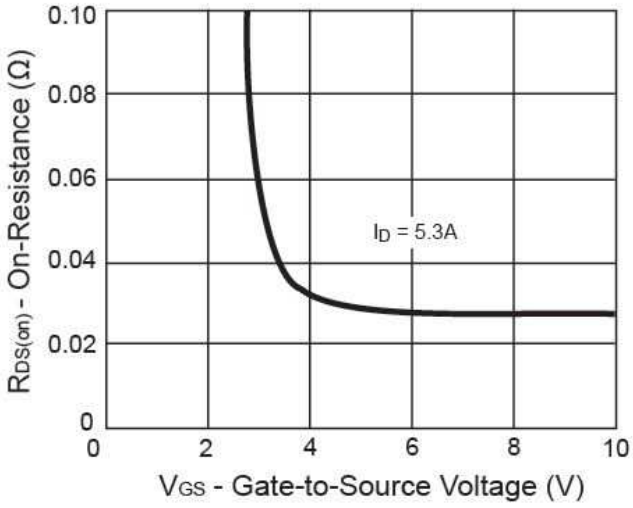


Source-Drain Diode Forward Voltage

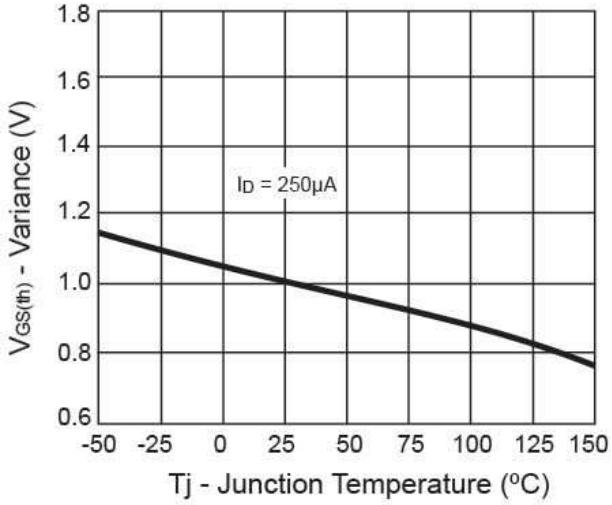


Electrical Characteristics Curve (Ta = 25°C, unless otherwise noted)

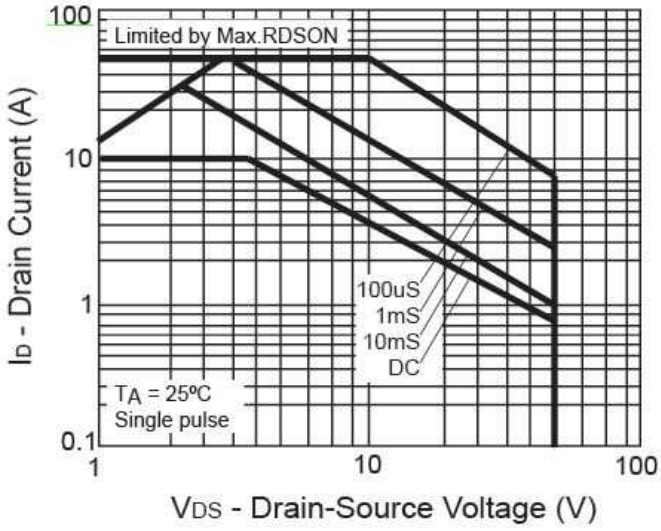
On-Resistance vs. Gate-Source Voltage



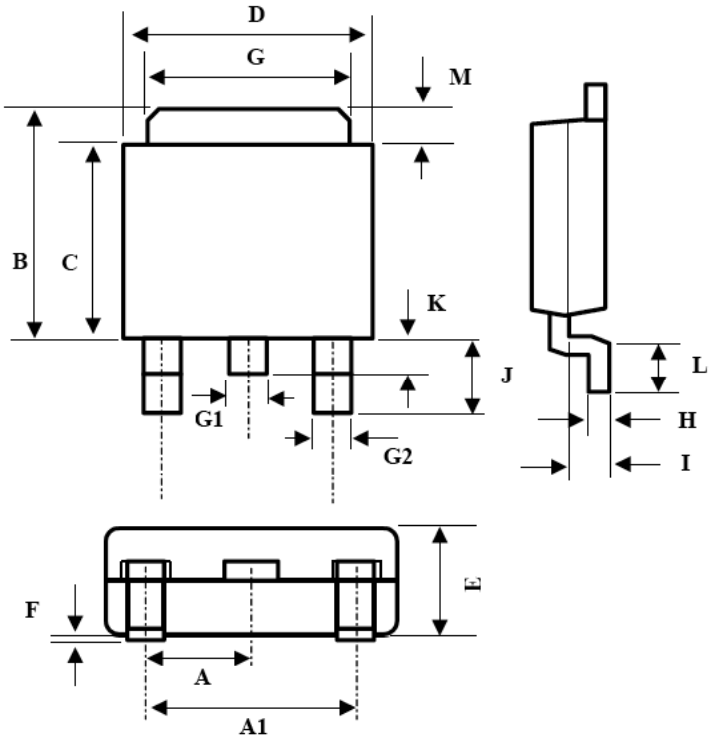
Threshold Voltage



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**=Apl, **E**=May, **F**=Jun, **G**=Jul, **H**=Aug, **I**=Sep, **J**=Oct, **K**=Nov, **L**=Dec)
L = Lot Code

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.