THE DATASHEET OF

TSM3481CX6 RFG

TAIWAN SEMICONDUCTOR

RoHS COMPLIANCE

TSM3481

30V P-Channel MOSFET

SOT-26

Pin Definition:
1. Drain 6. Drain
2. Drain 5, Drain
3. Gate 4. Source

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$(mΩ)	I_D (A)
-30	48 @ V_{GS} = -10V	-5.3
	79 @ V_{GS} = -4.5V	-4.1

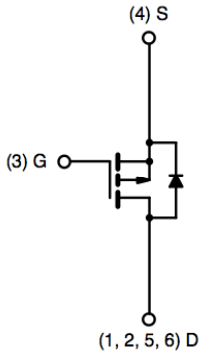
Features

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

Application

- DC-DC Conversion
- Asynchronous Buck Converter

Block Diagram



P-Channel MOSFET

Ordering Information

Part No.	Package	Packing
TSM3481CX6 RFG	SOT-26	3Kpcs / 7" Reel

Note: "G" denotes for Halogen Free

Absolute Maximum Rating (Ta = 25°C unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	-30	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current		I_D	-5.7	A
Pulsed Drain Current		I_{DM}	-22.8	A
Single Pulse Avalanche Current [c]		I_{AS}	-13	A
Single Pulse Avalanche Energy [c]		E_{AS}	25	mJ
Maximum Power Dissipation	Ta = 25°C	P_D	1.6	W
	Ta = 75°C		0.9	
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	$R\Theta_{JC}$	53	°C/W
Junction to Ambient Thermal Resistance (PCB mounted)	$R\Theta_{JA}$	80	°C/W

Notes:

a. Pulse width limited by the Maximum junction temperature

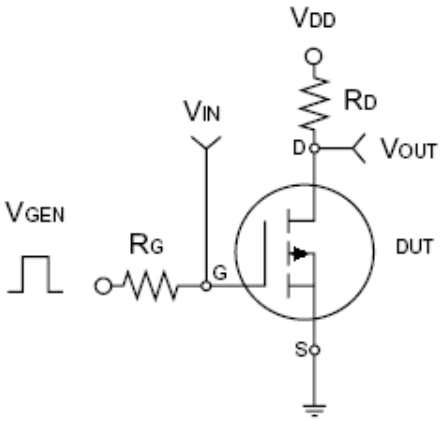
b. Surface Mounted on FR4 Board, t ≤ 10 sec.

c. L = 0.3mH, V_{GS} = -10V, V_{DD} = -25V, R_G = 25Ω, I_{AS} = -13A, Starting T_J = 25°C

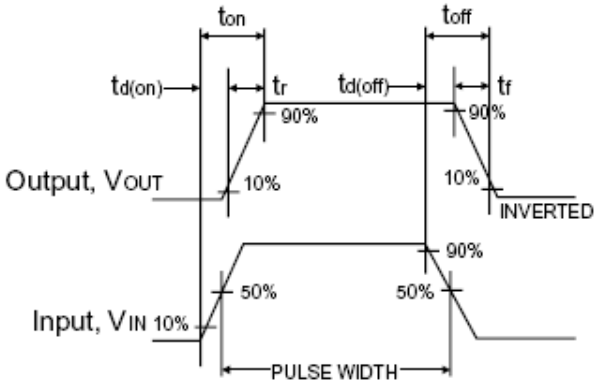
Electrical Specifications (Ta = 25°C unless otherwise noted)

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = -250uA	BV_{DSS}	-30	--	--	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} = -24V, V_{GS} = 0V	I_{DSS}	--	--	1.0	μA
On-State Drain Current[a]	V_{DS} ≤ -5V, V_{GS} = -4.5V	$I_{D(ON)}$	-20	--	--	A
Drain-Source On-State Resistance[a]	V_{GS} = -10V, I_D = -5.3A	$R_{DS(ON)}$	--	38	48	mΩ
	V_{GS} = -4.5V, I_D = -4.1A		--	63	79	
Forward Transconductance[a]	V_{DS} = -15V, I_D = -5.3A	g_{fs}	--	12	--	S
Diode Forward Voltage	I_S = -1.7A, V_{GS} = 0V	V_{SD}	--	-0.85	-1.2	V
Dynamic[b]						
Total Gate Charge	V_{DS} = -15V, I_D = -5.3A, V_{GS} = -10V	Q_g	--	18.09	--	nC
Gate-Source Charge		Q_{gs}	--	6.52	--	
Gate-Drain Charge		Q_{gd}	--	3.25	--	
Input Capacitance	V_{DS} = -15V, V_{GS} = 0V, f = 1.0MHz	C_{iss}	--	1047.98	--	pF
Output Capacitance		C_{oss}	--	172.82	--	
Reverse Transfer Capacitance		C_{rss}	--	115.50	--	
Switching[c]						
Turn-On Delay Time	V_{DD} = -15V, R_L = 15Ω, I_D = -1A, V_{GEN} = -10V, R_G = 6Ω	$t_{d(on)}$	--	20.52	--	nS
Turn-On Rise Time		t_r	--	4.43	--	
Turn-Off Delay Time		$t_{d(off)}$	--	42.81	--	
Turn-Off Fall Time		t_f	--	7.35	--	

Notes:
a. pulse test: PW ≤ 300μS, duty cycle ≤ 2%
b. For DESIGN AID ONLY, not subject to production testing.
c. Switching time is essentially independent of operating temperature.



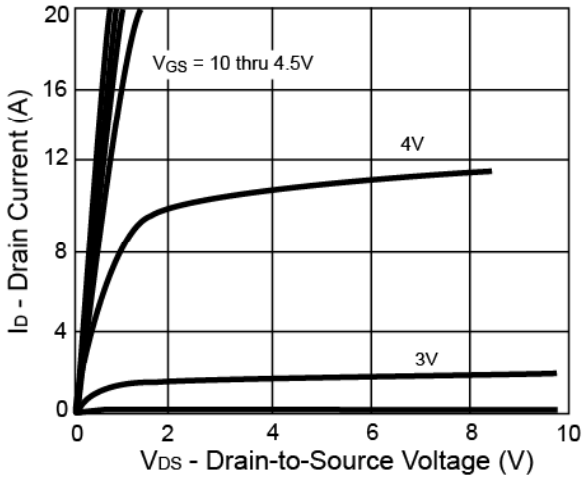
Switching Test Circuit



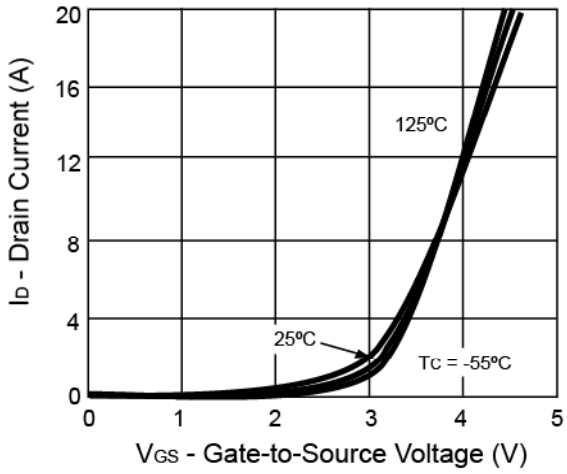
Switchin Waveforms

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

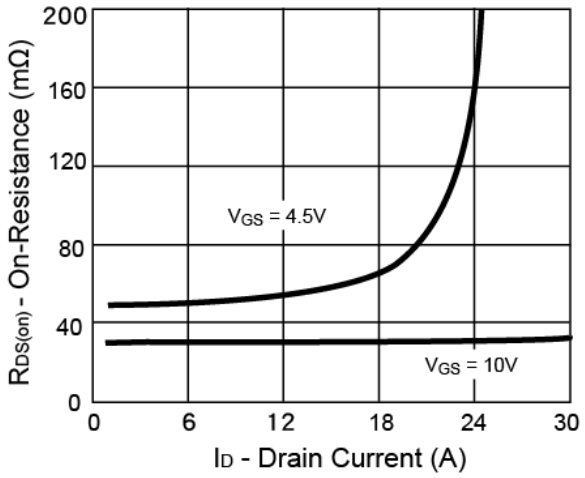
Output Characteristics



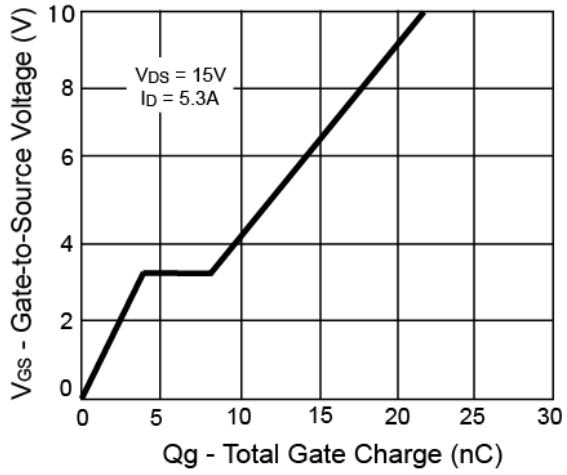
Transfer Characteristics



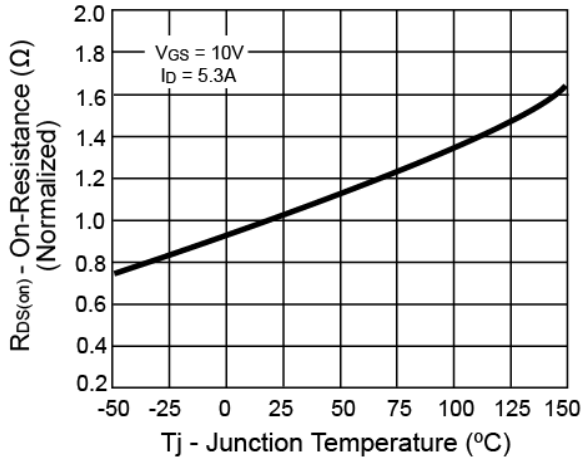
On-Resistance vs. Drain Current



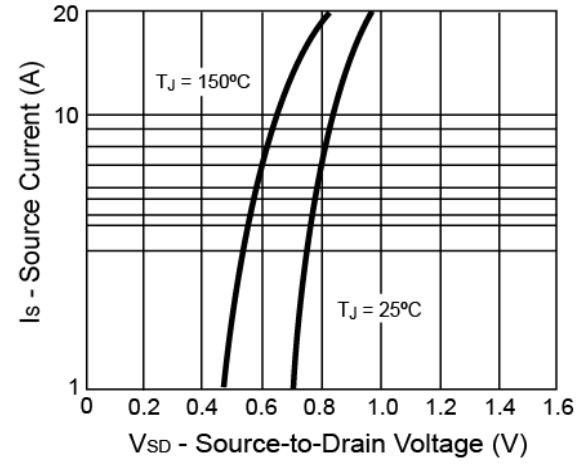
Gate Charge



On-Resistance vs. Junction Temperature

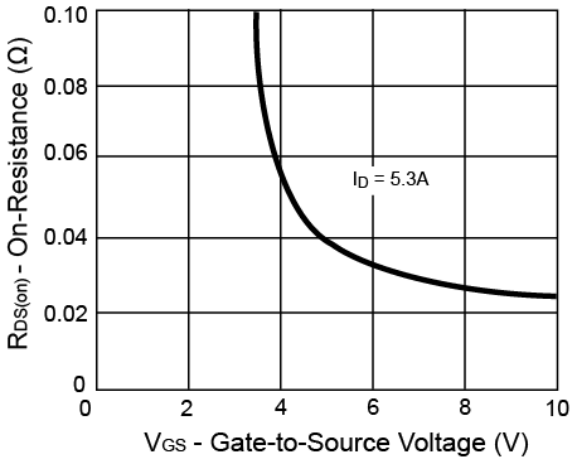


Source-Drain Diode Forward Voltage

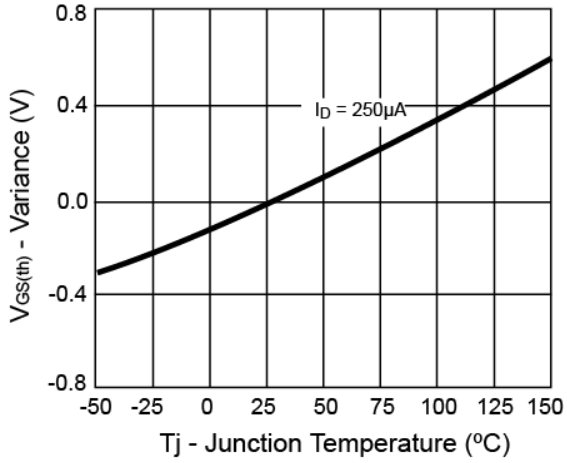


Electrical Characteristics Curve (Ta = 25°C, unless otherwise noted)

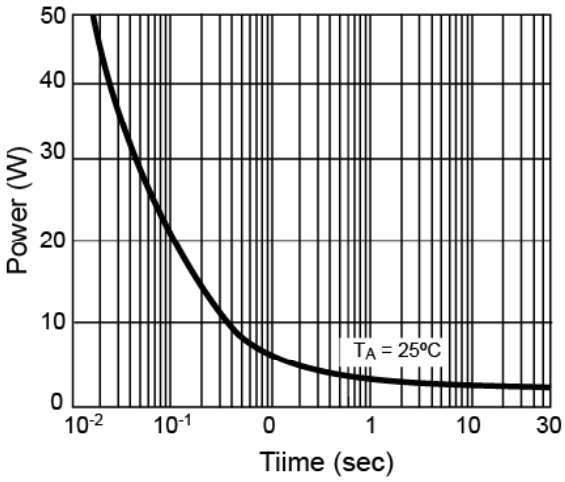
On-Resistance vs. Gate-Source Voltage



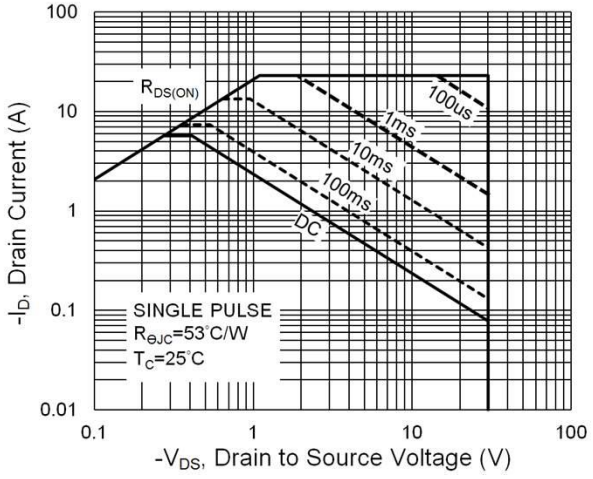
Threshold Voltage



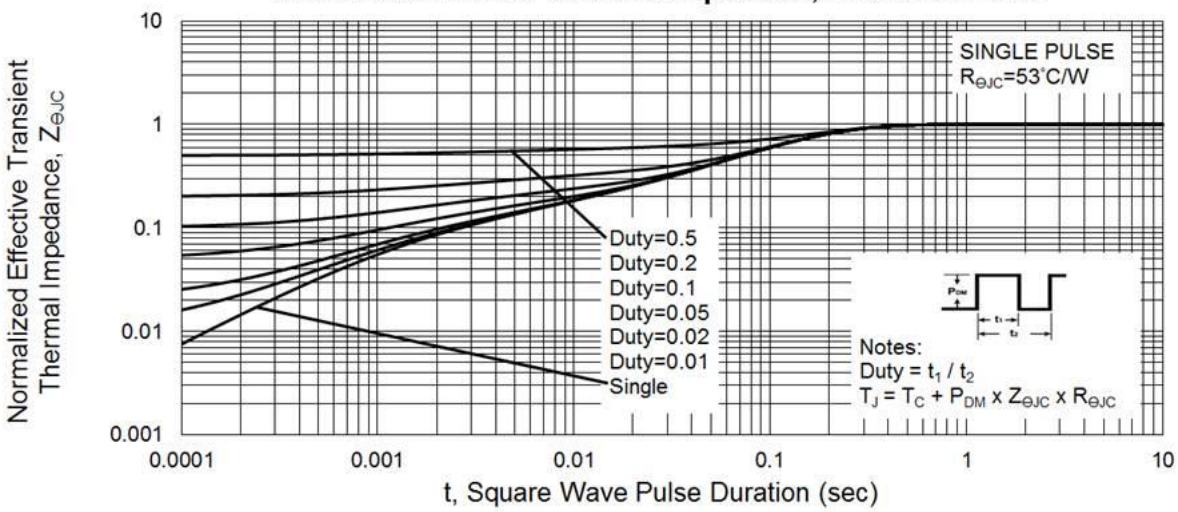
Single Pulse Power



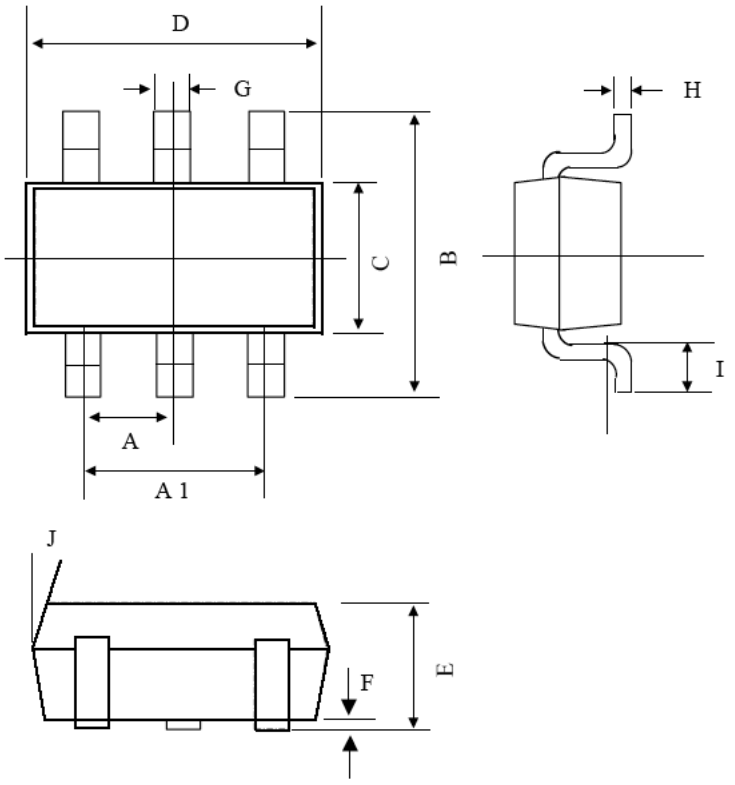
Maximum Safe Operating Area, Junction-to-Case



Normalized Thermal Transient Impedance, Junction-to-Case

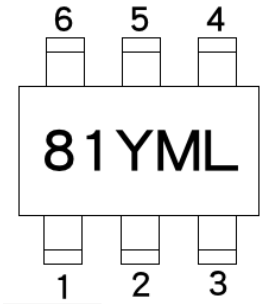


SOT-26 Mechanical Drawing



SOT-26 DIMENSION						
DIM	MILLIMETERS			INCHES		
	MIN	TYP	MAX	MIN	TYP	MAX
A	0.95 BSC			0.0374 BSC		
A1	1.9 BSC			0.0748 BSC		
B	2.60	2.80	3.00	0.1024	0.1102	0.1181
C	1.40	1.50	1.70	0.0551	0.0591	0.0669
D	2.80	2.90	3.10	0.1101	0.1142	0.1220
E	1.00	1.10	1.20	0.0394	0.0433	0.0472
F	0.00	--	0.10	0.00		0.0039
G	0.35	0.40	0.50	0.0138	0.0157	0.0197
H	0.10	0.15	0.20	0.0039	0.0059	0.0079
I	0.30	--	0.60	0.0118	--	0.0236
J	5º	--	10º	5º	--	10º

Marking Diagram



81 = Device Code
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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