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TSM4806

20V N-Channel MOSFET

SOP-8

Pin Definition:

1. Source 8. Drain
2. Source 7. Drain
3. Source 6. Drain
4. Gate 5. Drain

Note:

MSL 1 (Moisture Sensitivity Level) per J-STD-020

Key Parameter Performance

Parameter		Value	Unit
V_{DS}		20	V
$R_{DS(on)}$ (max)	V_{GS} = 4.5V	20	mΩ
	V_{GS} = 2.5V	25	
	V_{GS} = 1.8V	31	
Q_g		12.3	nC

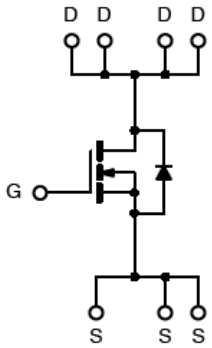
Features

- Advanced High Cell Density Trench Technology.
- Low Gate Charge.

Application

- Networking DC-DC Power System.
- Load Switch.

Block Diagram



N-Channel MOSFET

Ordering Information

Part No.	Package	Packing
TSM4806CS RLG	SOP-8	2.5kpcs / 13" Reel

•**Note:** Halogen-free according to IEC 61249-2-21 definition

Absolute Maximum Ratings (T_A=25°C, unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	20	V
Gate-Source Voltage		V_{GS}	±8	V
Continuous Drain Current [a]		I_D	28	A
Pulsed Drain Current [b]		I_{DM}	70	A
Continuous Source Current (Diode Conduction) [a,c]		I_S	28	A
Total Power Dissipation	T_A=25°C	P_D	2	W
Storage Temperature Range		T_{STG}	-55 to +150	°C
Operating Junction Temperature Range		T_J	-55 to +150	°C

Thermal Performance

Parameter	Symbol	Limit	Unit
Thermal Resistance Junction to Lead	$R\Theta_{JL}$	40	°C/W
Thermal Resistance Junction to Ambient	$R\Theta_{JA}$	62.5	°C/W

Notes:

a. The data tested by surface mounted on a 1 inch^2 FR-4 board with 2oz copper.

b. The data tested by pulsed, pulse width ≤ 300μs, duty cycle ≤ 2% surface mounted on FR4 Board, t ≤ 5s.

c. The data is theoretically the same as I_D and I_{DM}, in real applications, should be limited by total power dissipation.

Electrical Specifications

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 250μA	BV_{DSS}	20	--	--	V
Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	$V_{GS(TH)}$	0.3	0.6	1.0	V
Gate-Source Leakage Current	V_{GS} = ±8V, V_{DS} = 0V	I_{GSS}	--	--	±100	nA
Drain-Source Leakage Current	V_{DS} = 16V, V_{GS} = 0V	I_{DSS}	--	--	1	μA
Drain-Source On-State Resistance	V_{GS} = 4.5V, I_D = 20A	$R_{DS(ON)}$	--	16	20	mΩ
	V_{GS} = 2.5V, I_D = 15A		--	20	25	
	V_{GS} = 1.8V, I_D = 10A			25	31	
Forward Transconductance	V_{DS} = 5V, I_D = 15A	g_{fs}	--	27	--	S
Diode Forward Voltage	I_S = 1A, V_{GS} = 0V	V_{SD}	--	--	1.2	V
Dynamic[b]						
Gate Resistance	V_{DS} =0V, V_{GS} =0V, f=1MHz	R_g	--	1.4	2.8	Ω
Total Gate Charge	V_{DS} = 15V, I_D = 15A, V_{GS} = 4.5V	Q_g	--	12.3	--	nC
Gate-Source Charge		Q_{gs}	--	1.95	--	
Gate-Drain Charge		Q_{gd}	--	3.08	--	
Input Capacitance	V_{DS} = 15V, V_{GS} = 0V, f = 1MHz	C_{iss}	--	961	--	pF
Output Capacitance		C_{oss}	--	92.3	--	
Reverse Transfer Capacitance		C_{rss}	--	80.4	--	
Reverse Recovery Time	I_F= 15A, dI/dt= 100A/μs, T_J=25°C	t_{rr}	--	6	--	ns
Reverse Recovery Charge		Q_{rr}	--	1.38	--	nC
Switching[b,c]						
Turn-On Delay Time	V_{DD} = 10V, I_D = 15A, V_{GS} = 4.5V, R_G = 3.3Ω	$t_{d(on)}$	--	3.02	--	ns
Turn-On Rise Time		t_r	--	13.1	--	
Turn-Off Delay Time		$t_{d(off)}$	--	28	--	
Turn-Off Fall Time		t_f	--	8.3	--	

Notes:

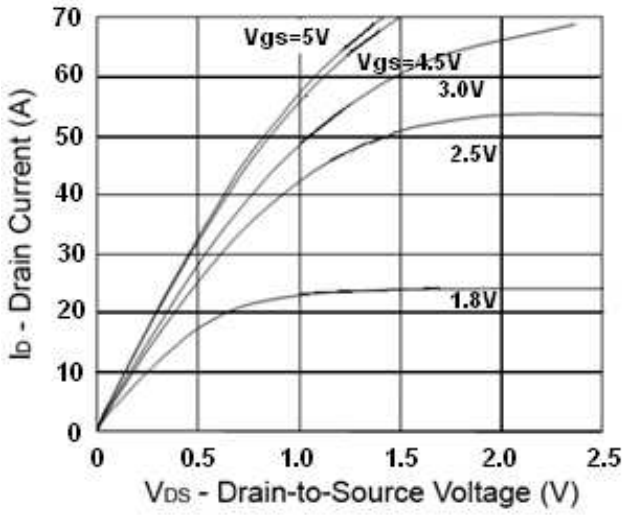
a. Pulse test: PW ≤ 300μs, duty cycle ≤ 2%

b. For DESIGN AID ONLY, not subject to production testing.

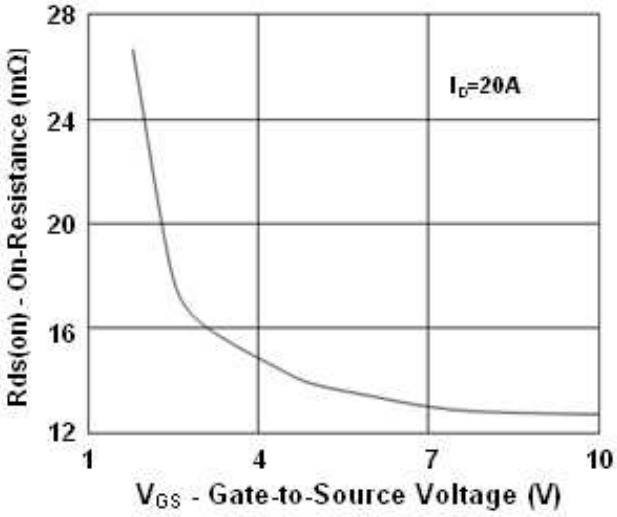
c. Switching time is essentially independent of operating temperature.

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

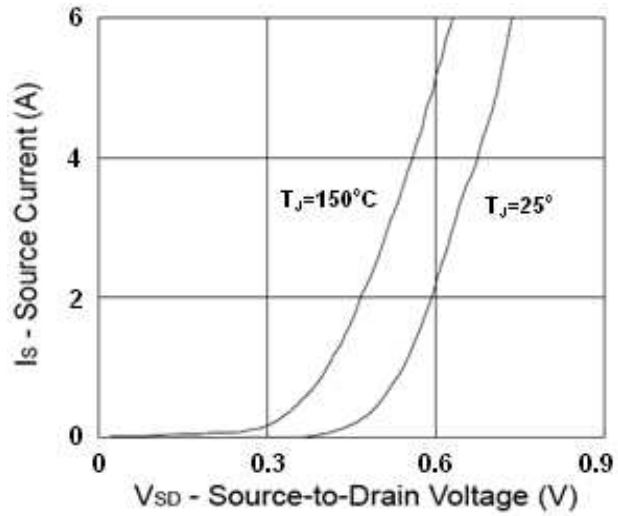
Output Characteristics



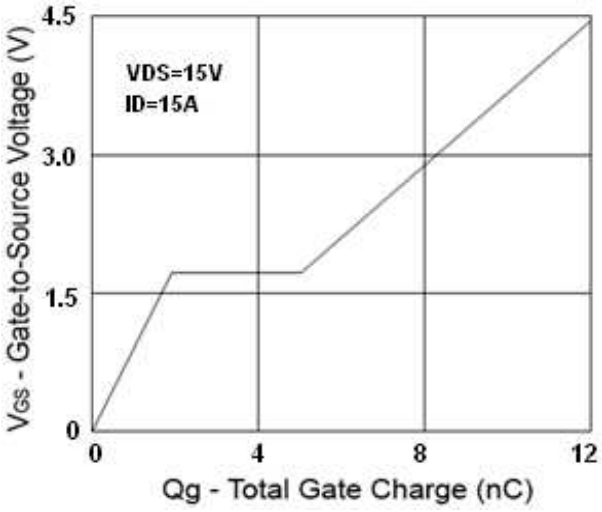
On-Resistance vs. Gate-Source Voltage



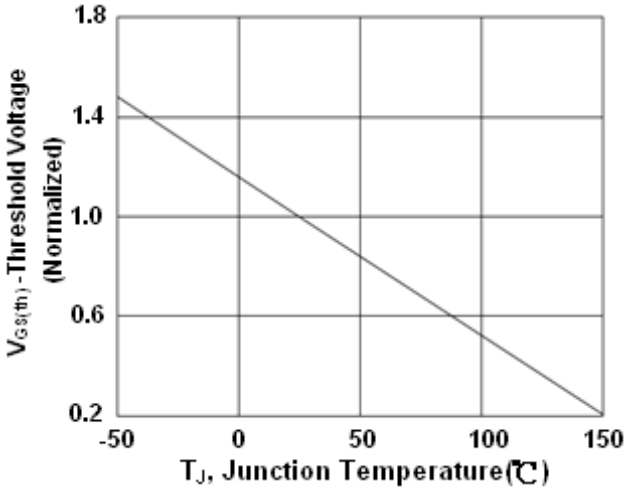
Source-Drain Diode Forward Voltage



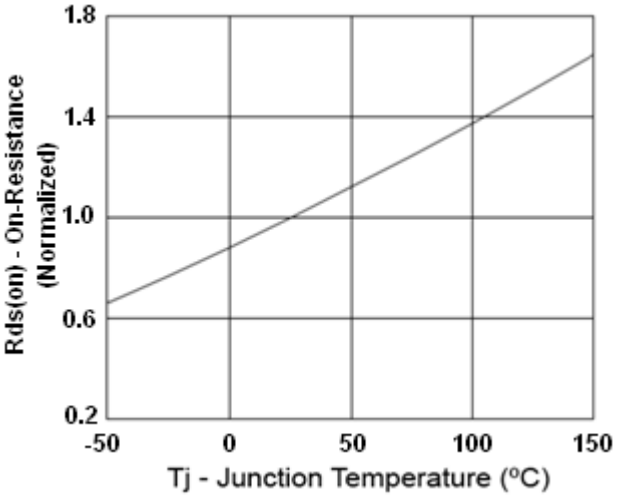
Gate Charge



Normalized $V_{GS(th)}$ vs. T_J

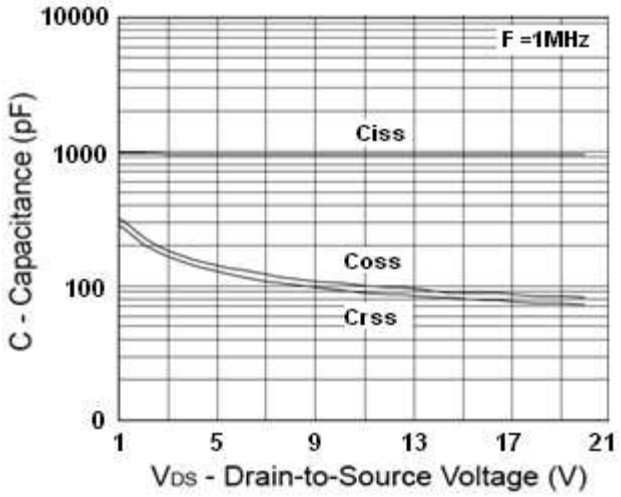


Normalized R_{DSON} vs. T_J

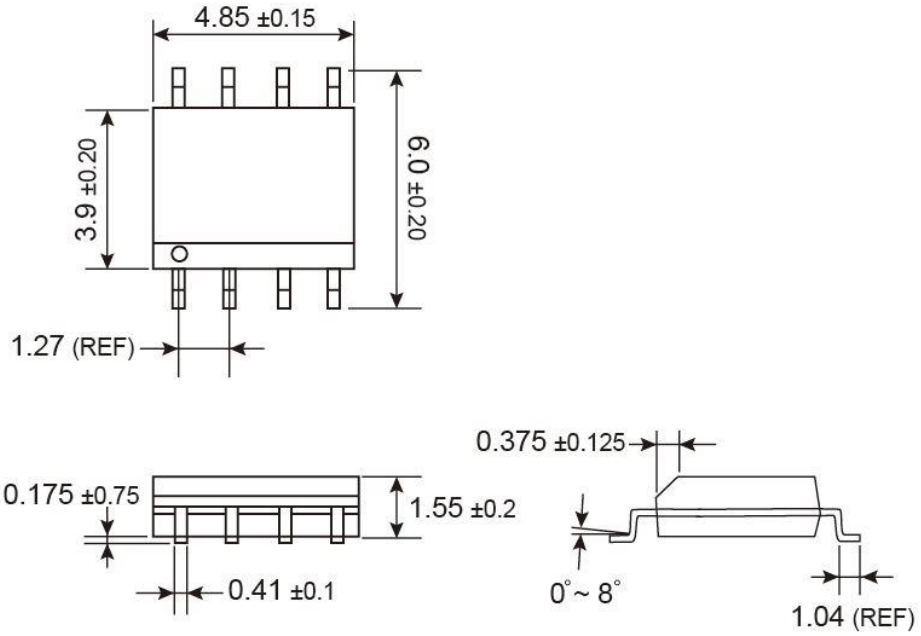


Electrical Characteristics Curve (T_A=25°C, unless otherwise noted)

Capacitance

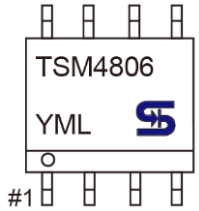


SOP-8 Mechanical Drawing



Unit: Millimeters

Marking Diagram



Y = Year Code
M = Month Code for Halogen Free Product
(**O**=Jan, **P**=Feb, **Q**=Mar, **R**=Apl, **S**=May, **T**=Jun, **U**=Jul, **V**=Aug, **W**=Sep, **X**=Oct, **Y**=Nov, **Z**=Dec)
L = Lot Code

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