TSM2831

20V P-Channel Enhancement Mode MOSFET

SOT-89

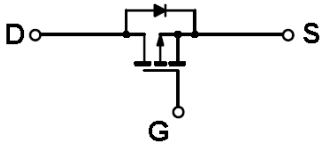
Pin assignment:
1. Gate
2. Drain
3. Source

V_{DS} = - 20V
$R_{DS\ (on)}$, Vgs @ - 4.5V, Ids @ - 2.8A =120mΩ
$R_{DS\ (on)}$, Vgs @ - 2.5V, Ids @ - 2.0A =180mΩ

Features

- ✧ Advanced trench process technology
- ✧ High density cell design for ultra low on-resistance
- ✧ Excellent thermal and electrical capabilities
- ✧ 2.5V operating voltage

Block Diagram



Ordering Information

Part No.	Packing	Package
TSM2831CY	Tape & Reel 1kpcs per reel	SOT-89

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

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	- 20V	V
Gate-Source Voltage		V_{GS}	± 8	V
Continuous Drain Current		I_D	- 2.8	A
Pulsed Drain Current		I_{DM}	- 10	A
Maximum Power Dissipation	Ta = 25 °C	P_D	1.5	W
	Ta = 75 °C		1.0	
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
Lead Temperature (1/8" from case)	T_L	5	S
Junction to Ambient Thermal Resistance (PCB mounted)	Rθja	65	°C/W

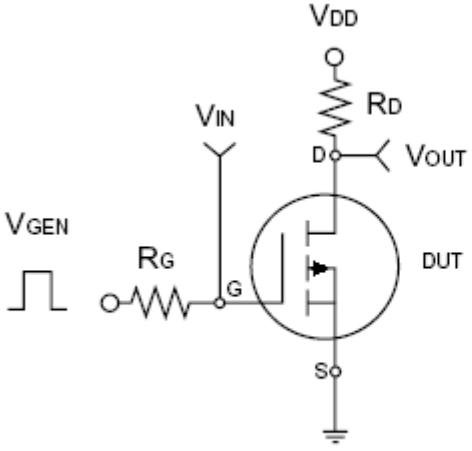
Note: Surface mounted on FR4 board t<=5sec.

Electrical Characteristics

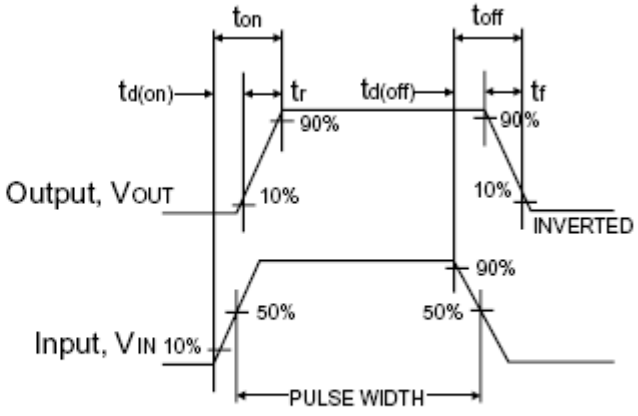
Ta = 25 °C, unless otherwise noted

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = - 250uA	BV_{DSS}	- 20	--	--	V
Drain-Source On-State Resistance	V_{GS} = - 4.5V, I_D = -2.8A	$R_{DS(ON)}$	--	95	120	mΩ
Drain-Source On-State Resistance	V_{GS} = - 2.5V, I_D = -1.5A	$R_{DS(ON)}$	--	122	180	
Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = - 250uA	$V_{GS(TH)}$	- 0.45	--	--	V
Zero Gate Voltage Drain Current	V_{DS} = - 16V, V_{GS} = 0V	I_{DSS}	--	--	- 1.0	uA
Gate Body Leakage	V_{GS} = ± 8V, V_{DS} = 0V	I_{GSS}	--	--	± 100	nA
On-State Drain Current	V_{DS} ≧- 10V, V_{GS} = -5V	$I_{D(ON)}$	- 6	--	--	A
Forward Transconductance	V_{DS} = - 5V, I_D = - 2.8A	g_{fs}	--	6.5	--	S
Dynamic						
Total Gate Charge	V_{DS} = - 6V, I_D = - 2.8A, V_{GS} = - 4.5V	Q_g	--	5.4	10	nC
Gate-Source Charge		Q_{gs}	--	0.8	--	
Gate-Drain Charge		Q_{gd}	--	1.1	--	
Turn-On Delay Time	V_{DD} = - 6V, R_L = 6Ω, I_D = - 1A, V_{GEN} = - 4.5V, R_G = 6Ω	$t_{d(on)}$	--	5	25	nS
Turn-On Rise Time		t_r	--	19	60	
Turn-Off Delay Time		$t_{d(off)}$	--	95	110	
Turn-Off Fall Time		t_f	--	65	80	
Input Capacitance	V_{DS} = - 6V, V_{GS} = 0V, f = 1.0MHz	C_{iss}	--	447	--	pF
Output Capacitance		C_{oss}	--	127	--	
Reverse Transfer Capacitance		C_{rss}	--	80	--	
Source-Drain Diode						
Max. Diode Forward Current		I_S	--	--	- 1.6	A
Diode Forward Voltage	I_S = - 1.6A, V_{GS} = 0V	V_{SD}	--	- 0.8	- 1.2	V

Note : pulse test: pulse width <=300uS, duty cycle <=2%



Switching Test Circuit

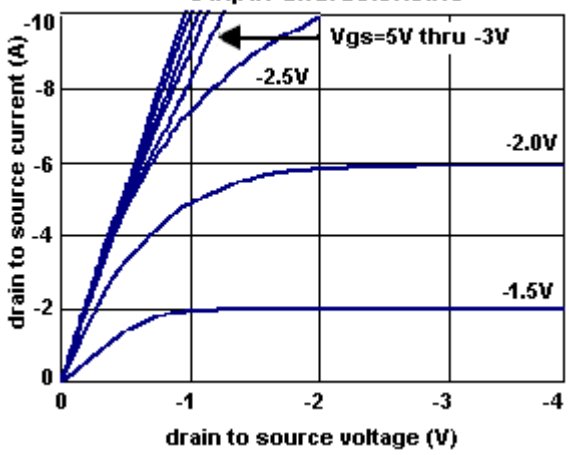


Switchin Waveforms

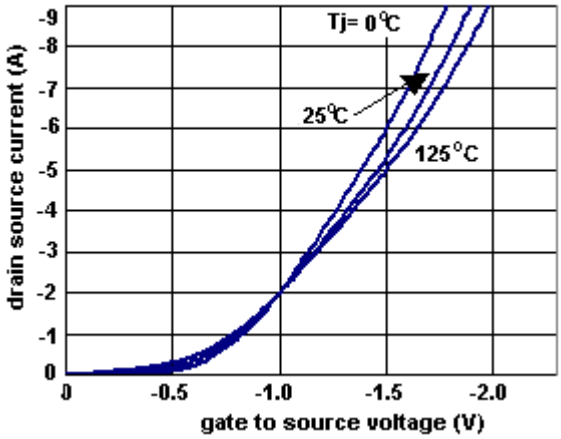
TSC

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

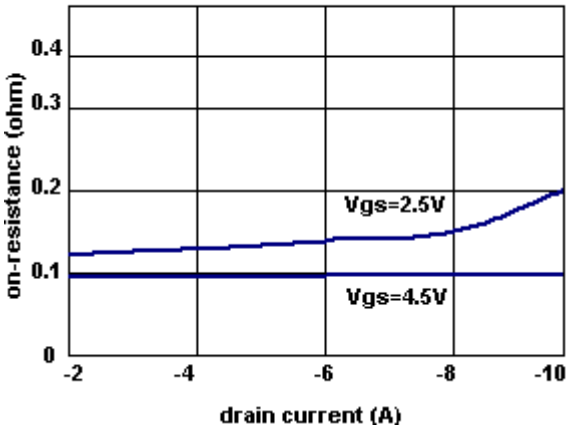
Output Characteristic



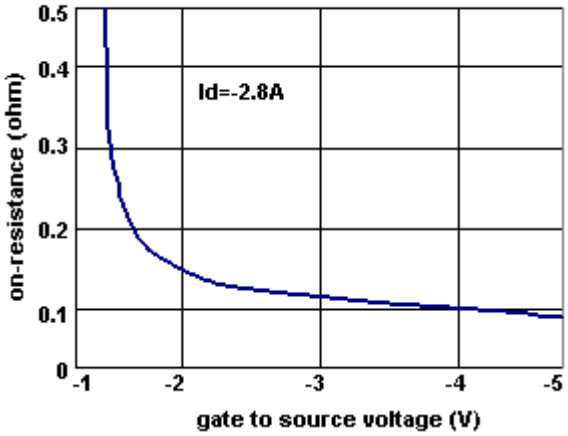
Transfer Characteristic



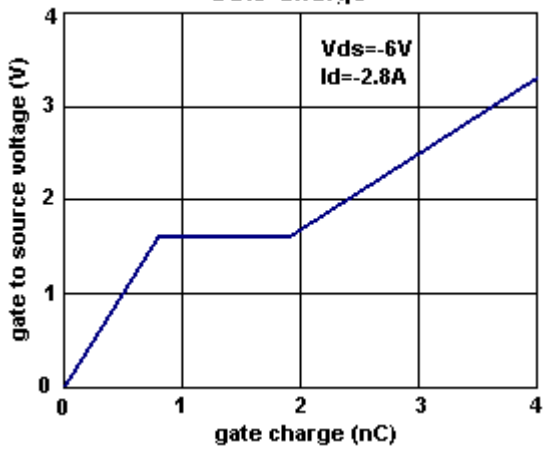
On Resistance vs Drain Current



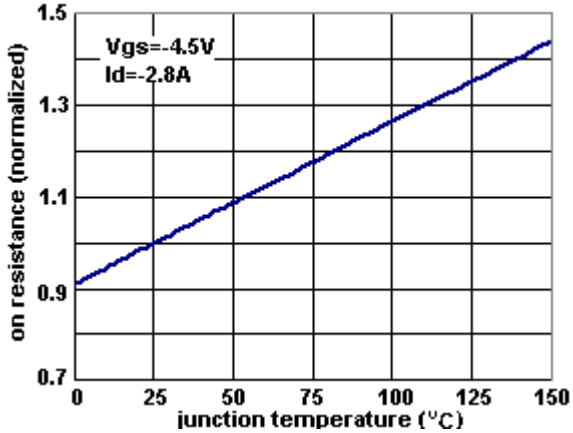
On Resistance vs Gate-Source



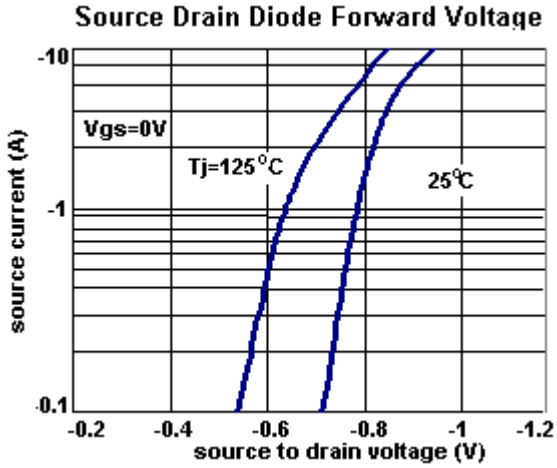
Gate Charge

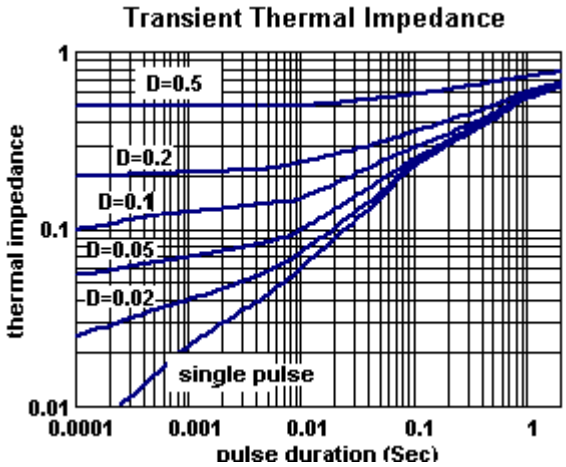


On Resistance vs Junction temp.

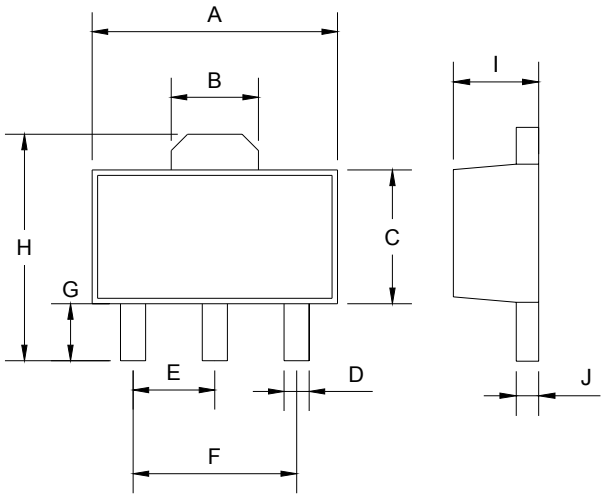


Typical Characteristics Curve (Ta = 25 °C unless otherwise noted)





SOT-89 Mechanical Drawing



SOT-89 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.40	4.60	0.173	0.181
B	1.50	1.7	0.059	0.070
C	2.30	2.60	0.090	0.102
D	0.40	0.52	0.016	0.020
E	1.50	1.50	0.059	0.059
F	3.00	3.00	0.118	0.118
G	0.89	1.20	0.035	0.047
H	4.05	4.25	0.159	0.167
I	1.4	1.6	0.055	0.068
J	0.35	0.44	0.014	0.017