



TSM2831

20V P-Channel Enhancement Mode MOSFET

SOT-89



Pin assignment:

1. Gate
2. Drain
3. Source

$V_{DS} = -20V$

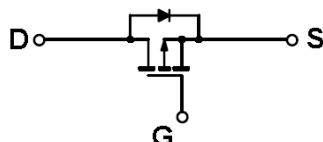
$R_{DS(on)}, V_{GS} @ -4.5V, I_{DS} @ -2.8A = 120m\Omega$

$R_{DS(on)}, V_{GS} @ -2.5V, I_{DS} @ -2.0A = 180m\Omega$

Features

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

Block Diagram



Ordering Information

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

Absolute Maximum Rating ($T_a = 25^\circ C$ 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

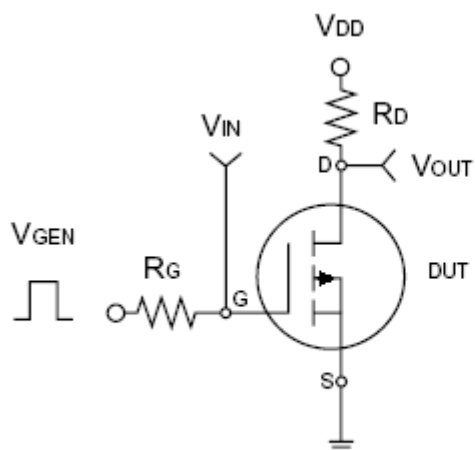
Thermal Performance

Parameter	Symbol	Limit	Unit
Lead Temperature (1/8" from case)	T_L	5	S
Junction to Ambient Thermal Resistance (PCB mounted)	$R_{\theta ja}$	65	$^\circ C/W$

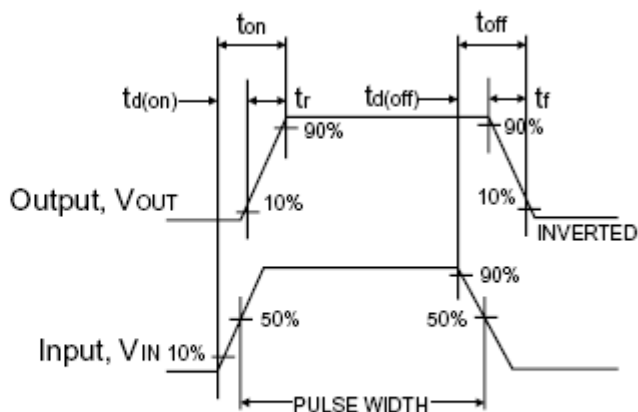
Note: Surface mounted on FR4 board $t \leq 5sec$.

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%

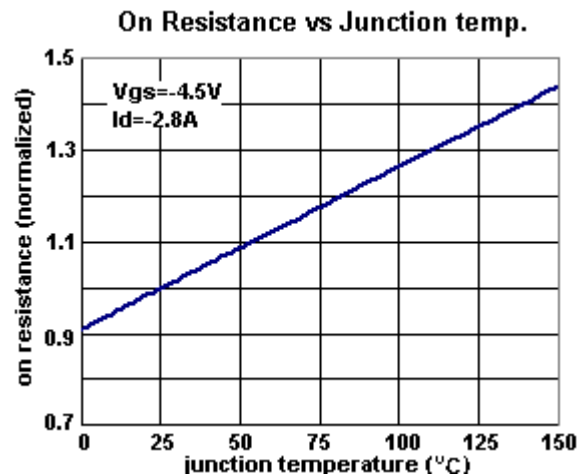
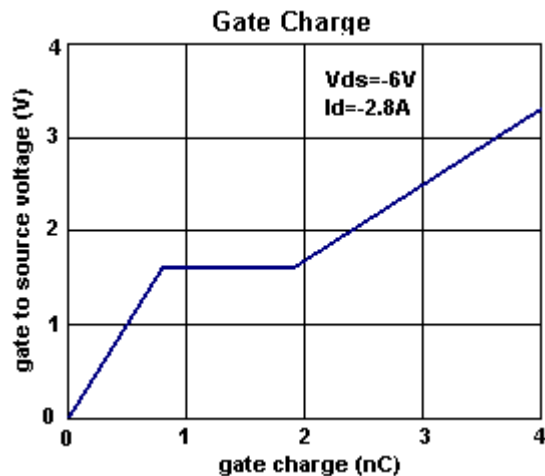
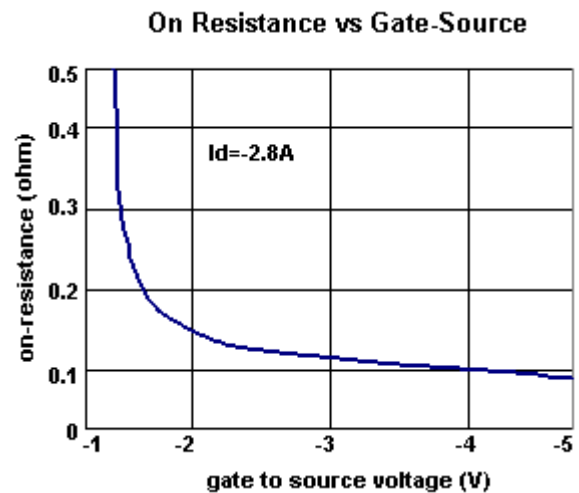
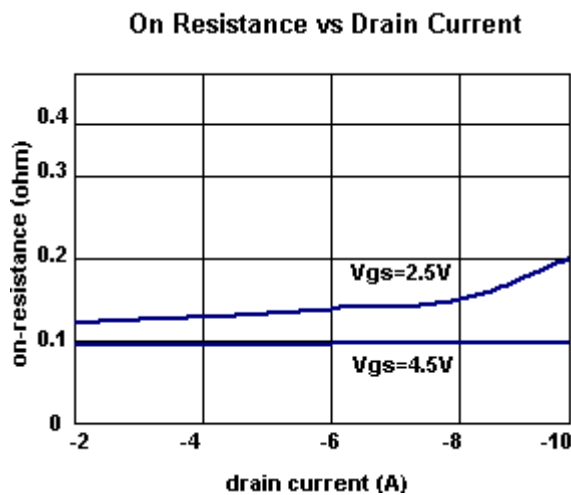
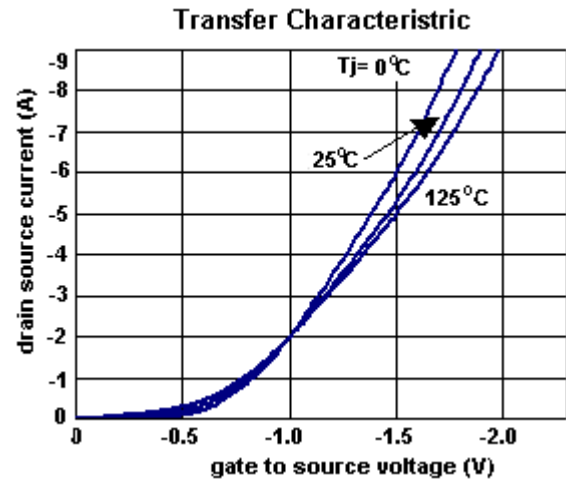
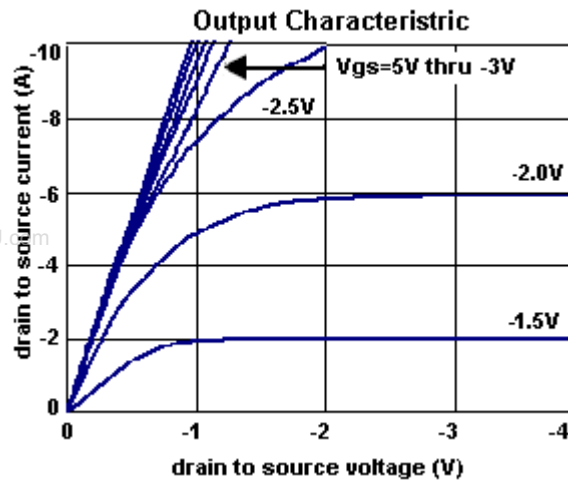


Switching Test Circuit

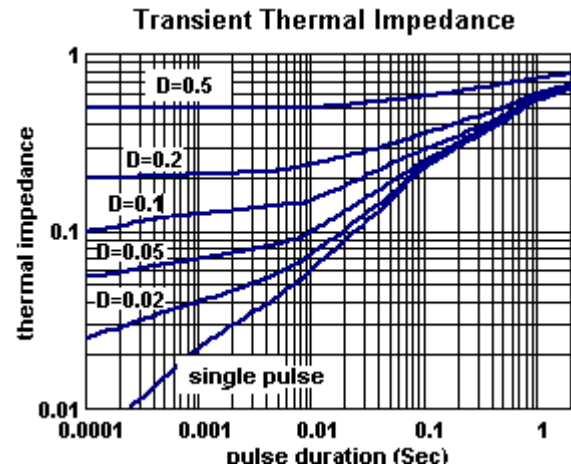
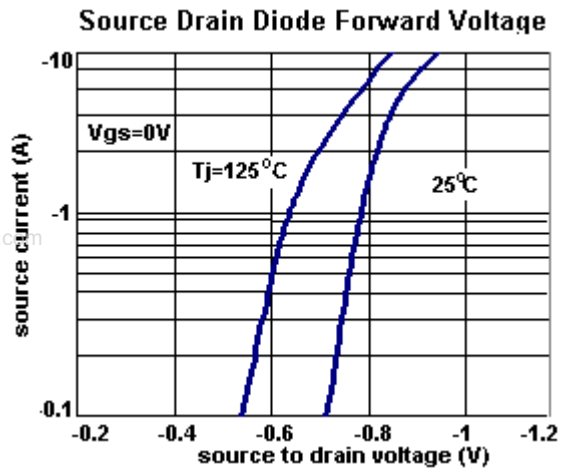


Switchin Waveforms

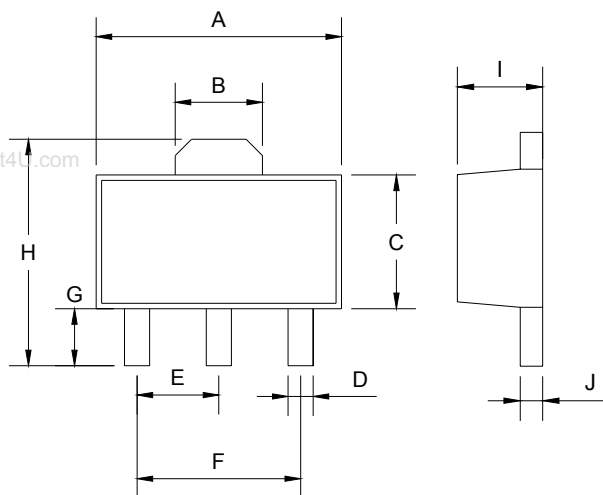
Typical Characteristics Curve (Ta = 25 °C unless otherwise noted)



Typical Characteristics Curve ($T_a = 25^\circ\text{C}$ 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