

SOT-26

Pin Definition:

- | | |
|-----------|-------------|
| 1. Gate 2 | 6. Source 2 |
| 2. Drain | 5. Drain |
| 3. Gate 1 | 4. Source 1 |

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (m Ω)	I_D (A)
20	35 @ $V_{GS} = 4.5V$	6.0
	40 @ $V_{GS} = 2.5V$	5.0

Features

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

Application

- Specially Designed for Li-on Battery Packs
- Battery Switch Application

Ordering Information

Part No.	Package	Packing
TSM6988DCX6 RF	SOT-26	3Kpcs / 7" Reel

Block Diagram

Dual N-Channel MOSFET

Absolute Maximum Rating ($T_a = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current, $V_{GS} @ 4.5V$.	I_D	6	A
Pulsed Drain Current, $V_{GS} @ 4.5V$	I_{DM}	30	A
Continuous Source Current (Diode Conduction) ^{a,b}	I_S	1.4	A
Maximum Power Dissipation	P_D	1.25	W
		0.8	
Operating Junction Temperature	T_J	+150	$^\circ\text{C}$
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

Thermal Performance

Parameter	Symbol	Limit	Unit
Junction to Foot (Drain) Thermal Resistance	$R_{\theta_{JF}}$	30	$^\circ\text{C/W}$
Junction to Ambient Thermal Resistance (PCB mounted)	$R_{\theta_{JA}}$	50	$^\circ\text{C/W}$

Notes:

- a. Pulse width limited by the Maximum junction temperature
b. Surface Mounted on FR4 Board, $t \leq 5$ sec.

Electrical Specifications

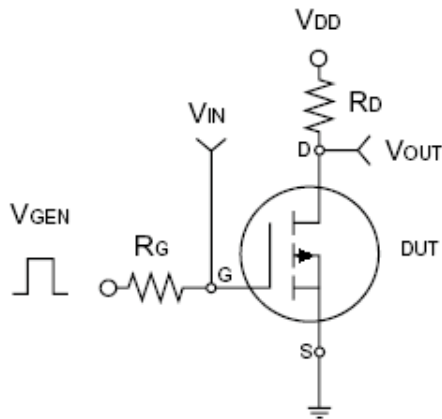
Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	BV_{DSS}	20	--	--	V
Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	$V_{GS(TH)}$	0.6	0.8	1.0	V
Gate Body Leakage	$V_{GS} = \pm 12V, V_{DS} = 0V$	I_{GSS}	--	--	± 10	μA
Zero Gate Voltage Drain Current	$V_{DS} = 16V, V_{GS} = 0V$	I_{DSS}	--	--	1.0	μA
On-State Drain Current	$V_{DS} \geq 5V, V_{GS} = 4.5V$	$I_{D(ON)}$	30	--	--	A
Drain-Source On-State Resistance	$V_{GS} = 4.5V, I_D = 6.0A$	$R_{DS(ON)}$	--	30	35	m Ω
	$V_{GS} = 2.5V, I_D = 5.0A$		--	35	40	
Forward Transconductance	$V_{DS} = 10V, I_D = 6.0A$	g_{fs}	--	30	--	S
Diode Forward Voltage	$I_S = 1.5A, V_{GS} = 0V$	V_{SD}	--	0.6	1.2	V
Dynamic ^b						
Total Gate Charge	$V_{DS} = 10V, I_D = 6A,$ $V_{GS} = 4.5V$	Q_g	--	15	20	nC
Gate-Source Charge		Q_{gs}	--	3.4	--	
Gate-Drain Charge		Q_{gd}	--	1.2	--	
Input Capacitance	$V_{DS} = 10V, V_{GS} = 0V,$ $f = 1.0MHz$	C_{iss}	--	950	--	pF
Output Capacitance		C_{oss}	--	450	--	
Reverse Transfer Capacitance		C_{rss}	--	135	--	
Switching ^c						
Turn-On Delay Time	$V_{DD} = 10V, R_L = 10\Omega,$ $I_D = 1A, V_{GEN} = 4.5V,$ $R_G = 6\Omega$	$t_{d(on)}$	--	140	200	nS
Turn-On Rise Time		t_r	--	210	250	
Turn-Off Delay Time		$t_{d(off)}$	--	3700	4800	
Turn-Off Fall Time		t_f	--	2000	2600	

Notes:

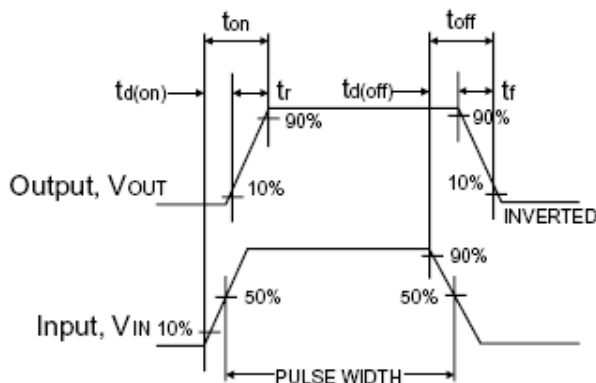
a. pulse test: PW $\leq 300\mu S$, duty cycle $\leq 2\%$

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

c. Switching time is essentially independent of operating temperature.



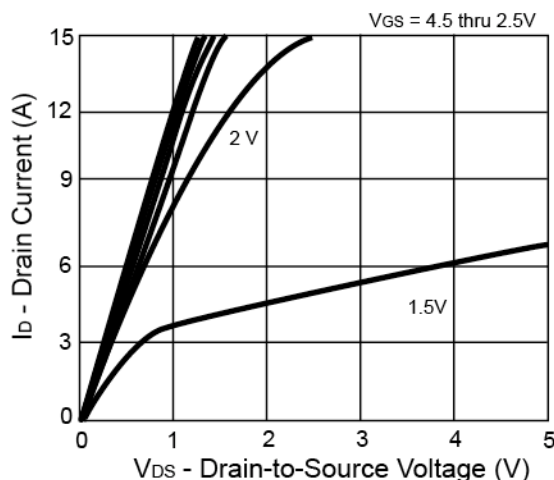
Switching Test Circuit



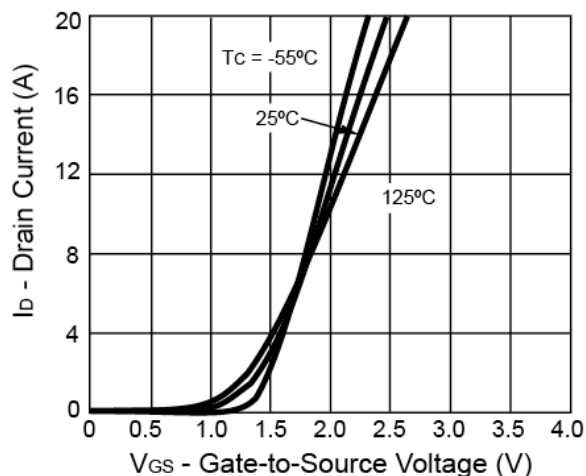
Switchin Waveforms

Electrical Characteristics Curve ($T_a = 25^\circ\text{C}$, unless otherwise noted)

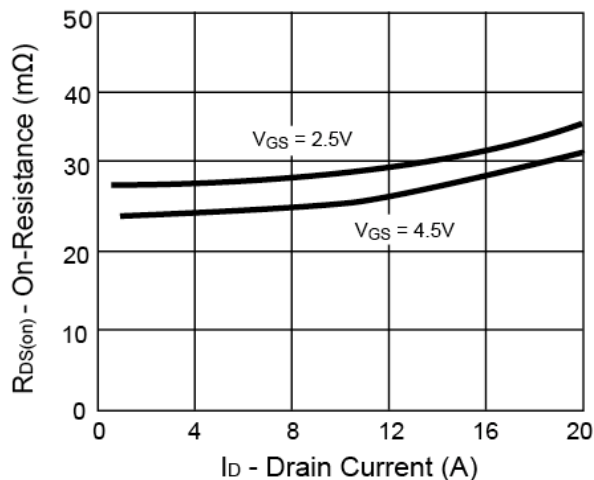
Output Characteristics



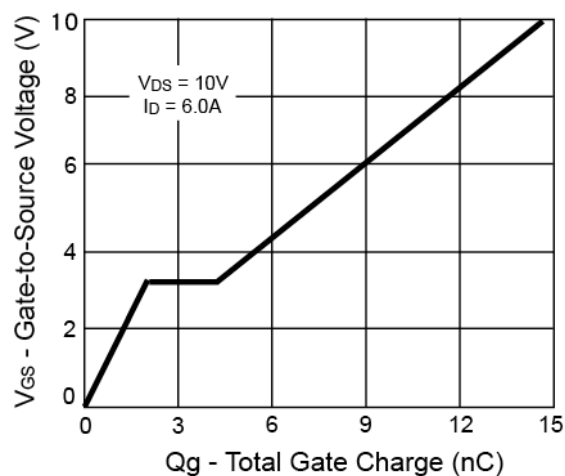
Transfer Characteristics



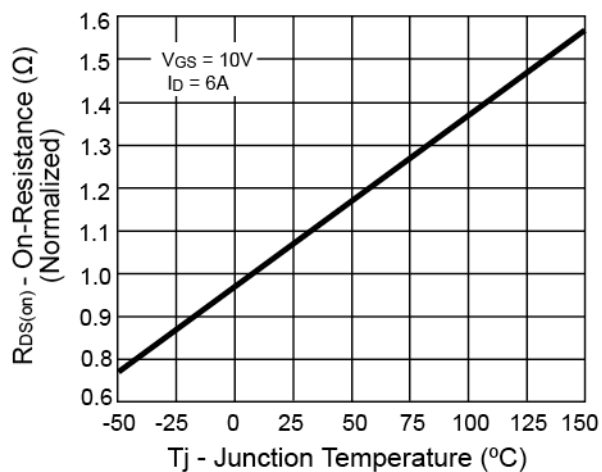
On-Resistance vs. Drain Current



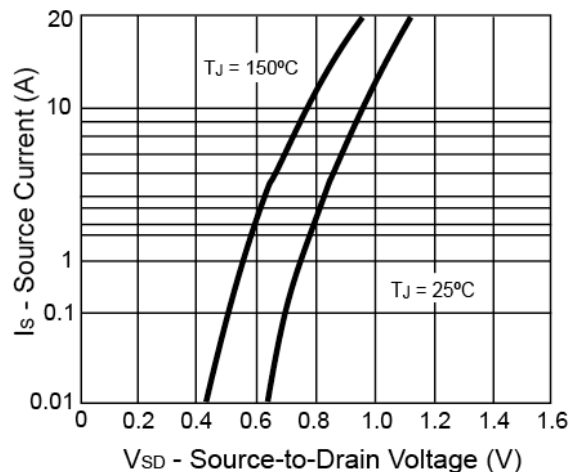
Gate Charge



On-Resistance vs. Junction Temperature

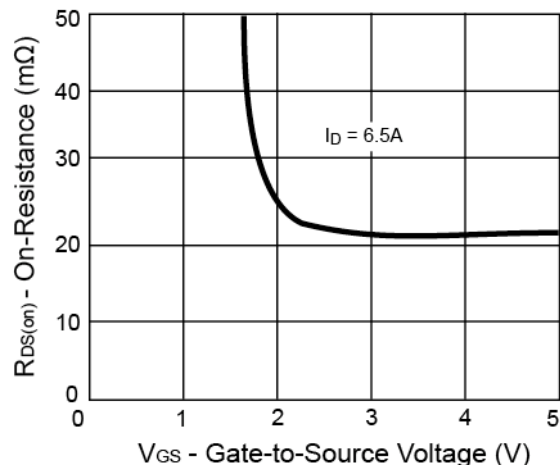


Source-Drain Diode Forward Voltage

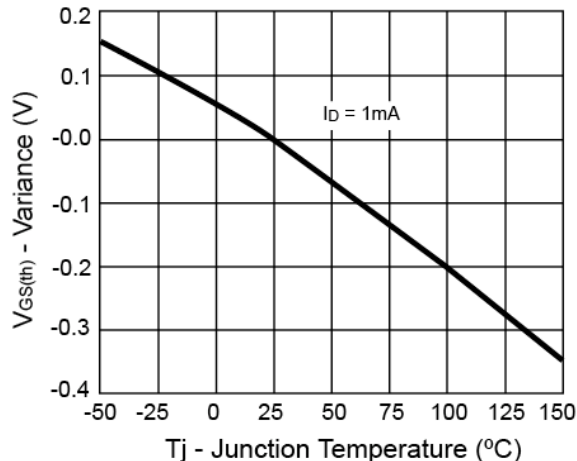


Electrical Characteristics Curve ($T_A = 25^\circ\text{C}$, unless otherwise noted)

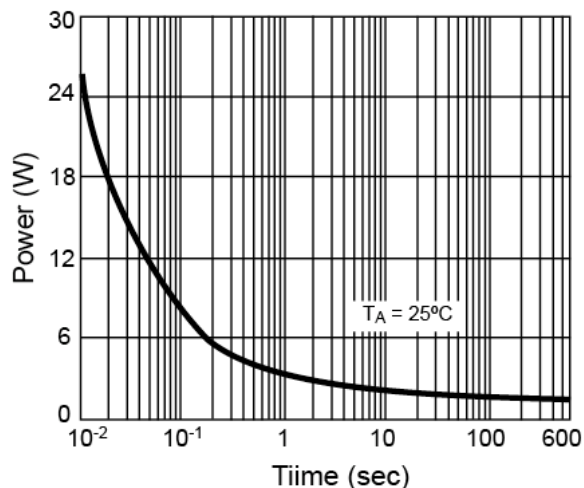
On-Resistance vs. Gate-Source Voltage



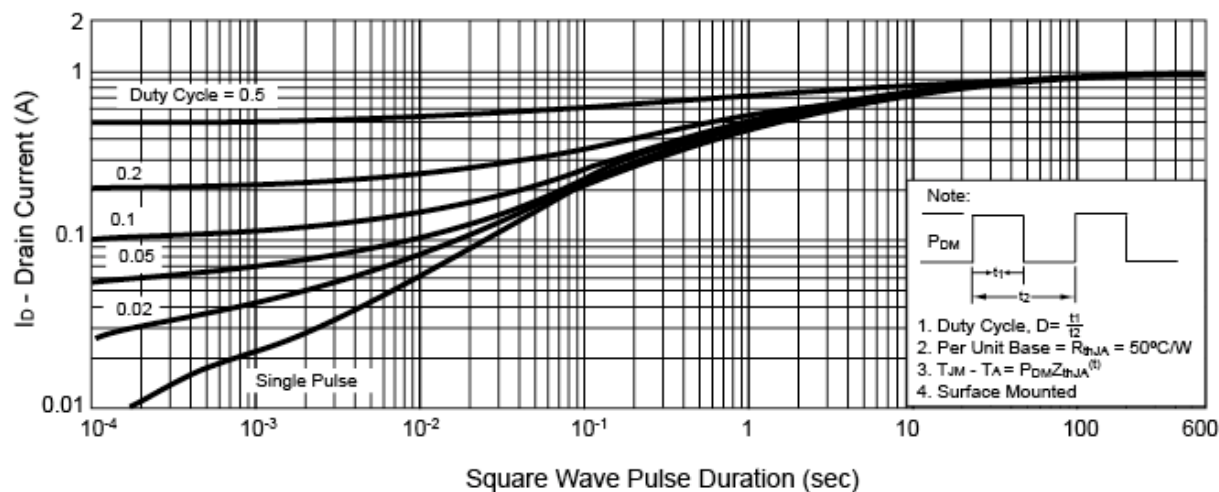
Threshold Voltage



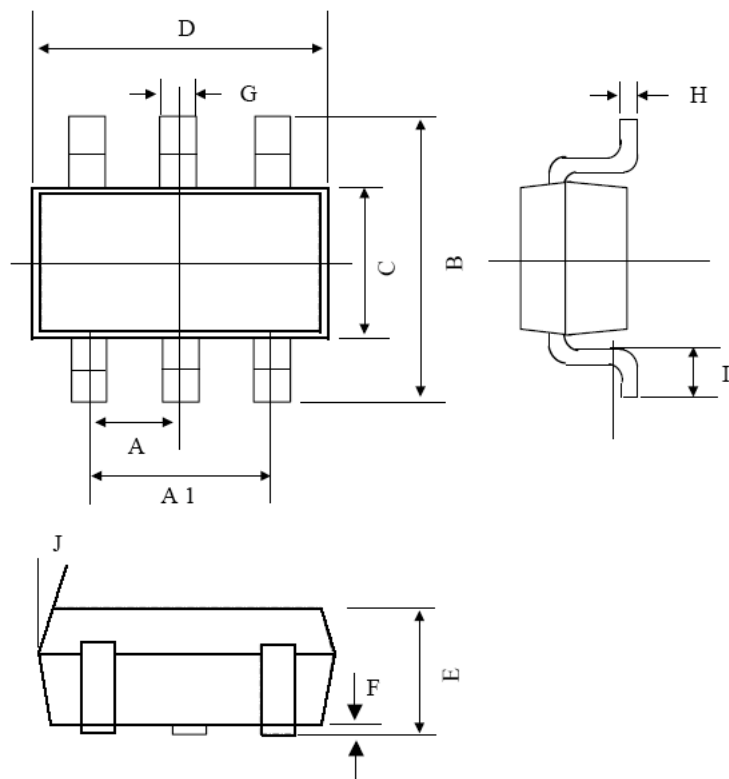
Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient

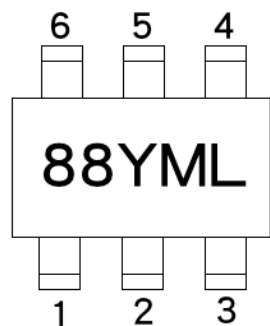


SOT-26 Mechanical Drawing



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	5°	--	10°	5°	--	10°

Marking Diagram



60 = Device Code

Y = Year Code

M = Month Code

(**A**=Jan, **B**=Feb, **C**=Mar, **D**=Apr, **E**=May, **F**=Jun, **G**=Jul, **H**=Aug,
I=Sep, **J**=Oct, **K**=Nov, **L**=Dec)

L = Lot Code

20V Dual N-Channel MOSFET w/ESD Protected

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