

SOT-26

Pin Definition:

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

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (m Ω)	I_D (A)
20	55 @ $V_{GS} = 4.5V$	2.0
	70 @ $V_{GS} = 2.5V$	1.5
	110 @ $V_{GS} = 1.8V$	1.0

Features

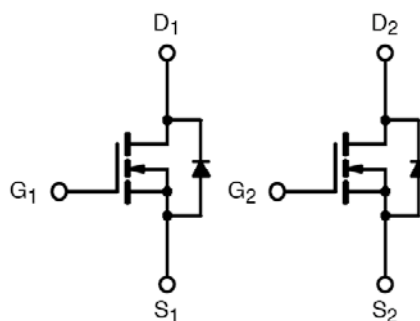
- Advance Trench Process Technology
- High Density Cell Design for Ultra Low On-resistance

Application

- Load Switch
- PA Switch

Ordering Information

Part No.	Package	Packing
TSM3900DCX6 RF	SOT-26	T&R

Block Diagram


Dual N-Channel MOSFET

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 8	V
Continuous Drain Current	I_D	2	A
Pulsed Drain Current	I_{DM}	8	A
Continuous Source Current (Diode Conduction) ^{a,b}	I_S	1.6	A
Maximum Power Dissipation	P_D	2.0	W
		1.3	
Operating Junction Temperature	T_J	+150	$^\circ C$
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ C$

Thermal Performance

Parameter	Symbol	Limit	Unit
Junction to Case Thermal Resistance	$R_{\theta JC}$	30	$^\circ C/W$
Junction to Ambient Thermal Resistance (PCB mounted)	$R_{\theta JA}$	80	$^\circ C/W$

Notes:

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

Electrical Specifications

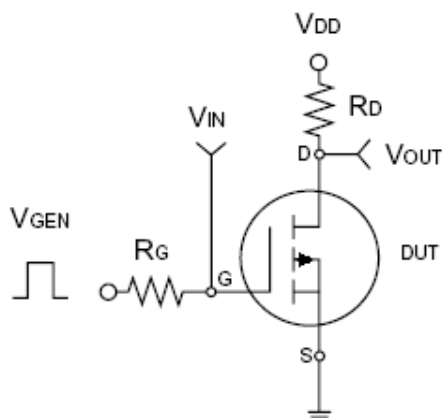
Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	BV_{DSS}	20	--	--	V
Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	$V_{GS(TH)}$	0.65	0.95	1.2	V
Gate Body Leakage	$V_{GS} = \pm 8V, V_{DS} = 0V$	I_{GSS}	--	--	± 100	nA
Zero Gate Voltage Drain Current	$V_{DS} = 16V, V_{GS} = 0V$	I_{DSS}	--	--	1.0	μA
On-State Drain Current	$V_{DS} \geq 5V, V_{GS} = 4.5V$	$I_{D(ON)}$	5	--	--	A
Drain-Source On-State Resistance	$V_{GS} = 4.5V, I_D = 2.0A$	$R_{DS(ON)}$	--	45	55	m Ω
	$V_{GS} = 2.5V, I_D = 1.5A$		--	50	70	
	$V_{GS} = 1.8V, I_D = 1.0A$		--	80	110	
Forward Transconductance	$V_{DS} = 5V, I_D = 2.4A$	g_{fs}	--	5	--	S
Diode Forward Voltage	$I_S = 1.6A, V_{GS} = 0V$	V_{SD}	--	0.79	1.1	V
Dynamic ^b						
Total Gate Charge	$V_{DS} = 10V, I_D = 2.4A,$ $V_{GS} = 4.5V$	Q_g	--	3.69	--	nC
Gate-Source Charge		Q_{gs}	--	0.70	--	
Gate-Drain Charge		Q_{gd}	--	1.06	--	
Input Capacitance	$V_{DS} = 10V, V_{GS} = 0V,$ $f = 1.0MHz$	C_{iss}	--	427.12	--	pF
Output Capacitance		C_{oss}	--	80.56	--	
Reverse Transfer Capacitance		C_{rss}	--	57	--	
Switching ^c						
Turn-On Delay Time	$V_{DD} = 10V, R_L = 10\Omega,$ $I_D = 1A, V_{GEN} = 4.5V,$ $R_G = 6\Omega$	$t_{d(on)}$	--	6.16	--	nS
Turn-On Rise Time		t_r	--	7.56	--	
Turn-Off Delay Time		$t_{d(off)}$	--	16.61	--	
Turn-Off Fall Time		t_f	--	4.07	--	

Notes:

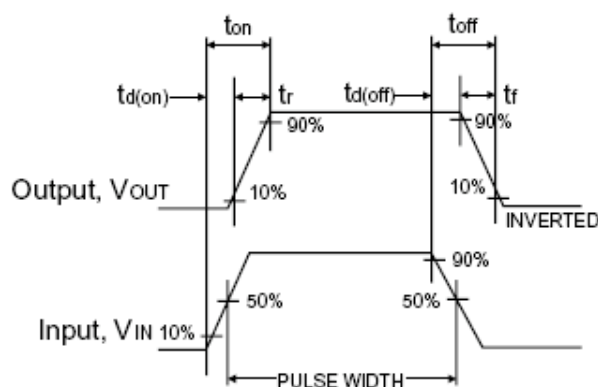
a. pulse test: $PW \leq 300\mu s$, duty cycle $\leq 2\%$

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

b. Switching time is essentially independent of operating temperature.



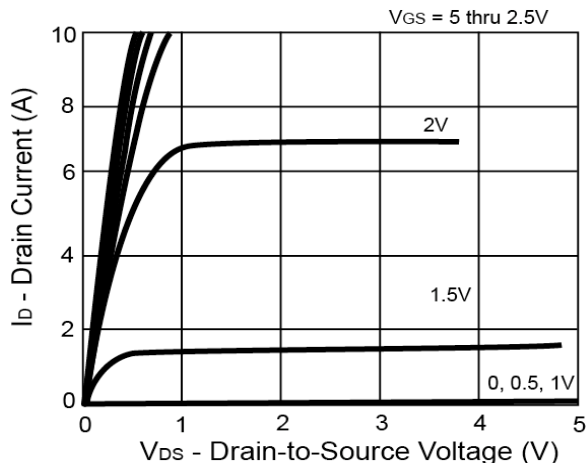
Switching Test Circuit



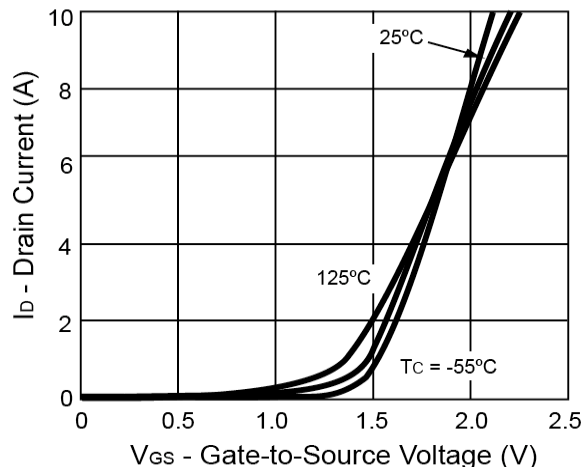
Switchin Waveforms

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

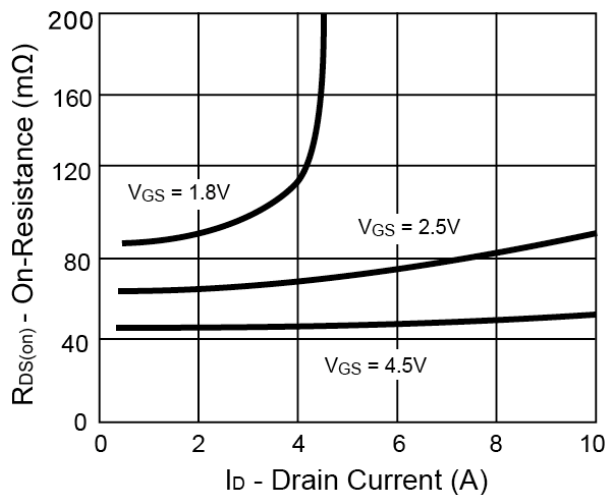
Output Characteristics



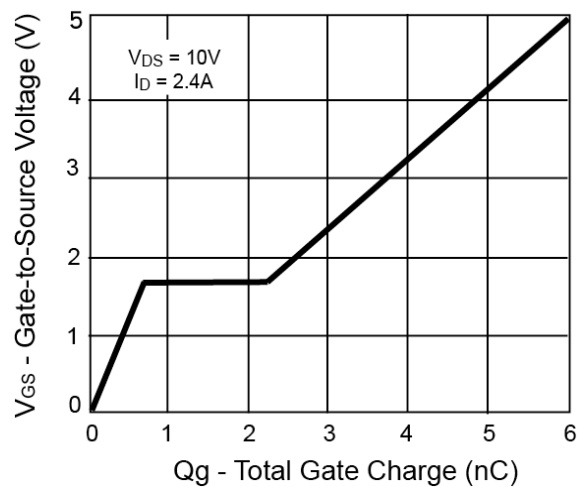
Transfer Characteristics



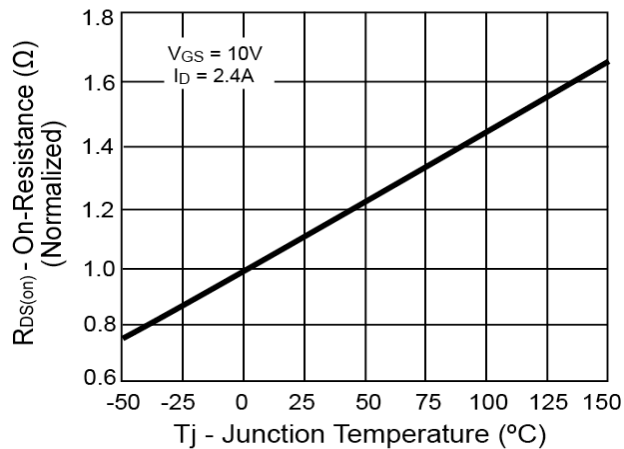
On-Resistance vs. Drain Current



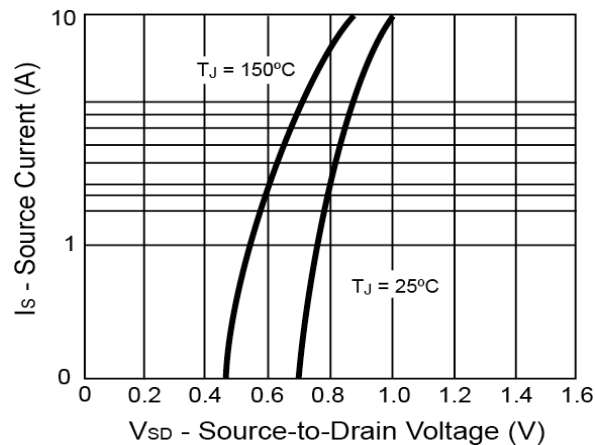
Gate Charge



On-Resistance vs. Junction Temperature

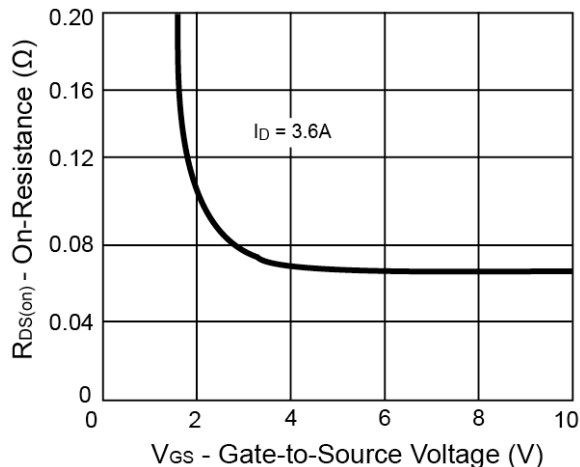


Source-Drain Diode Forward Voltage

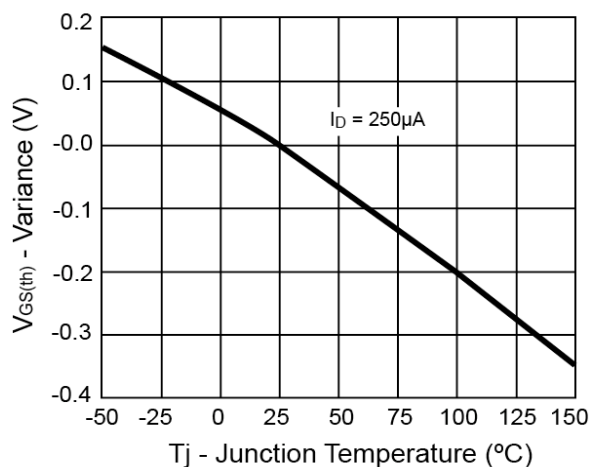


Electrical Characteristics Curve (Ta = 25°C, unless otherwise noted)

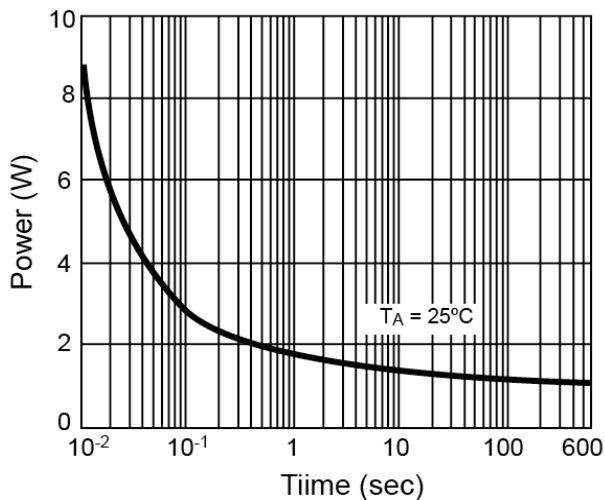
On-Resistance vs. Gate-Source Voltage



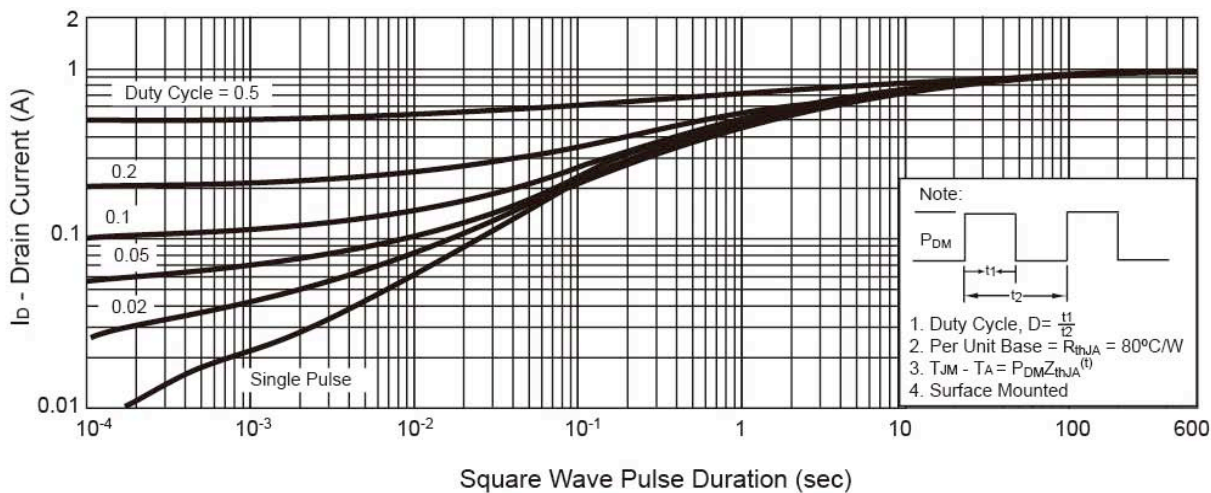
Threshold Voltage



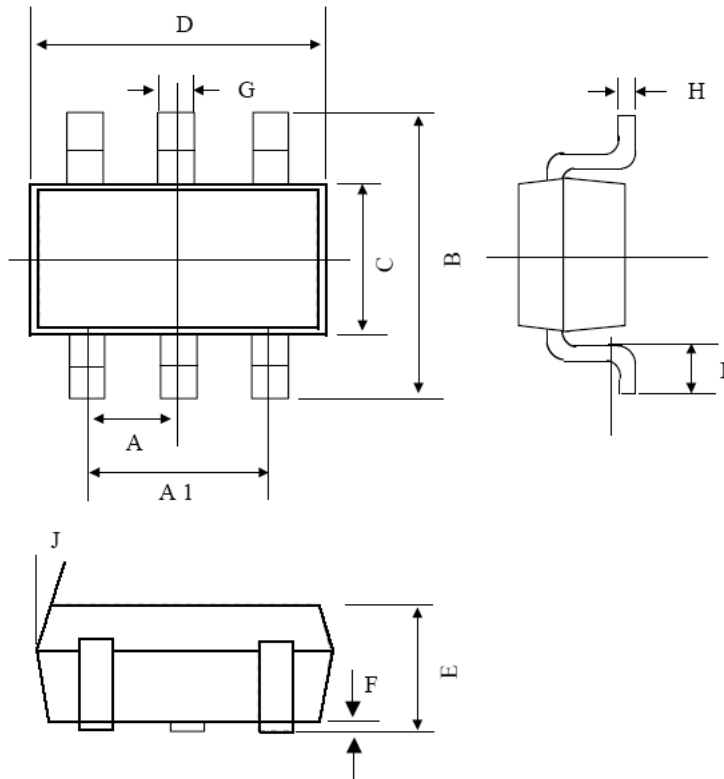
Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient

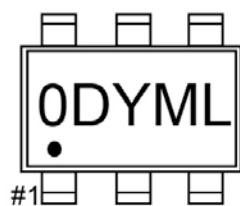


SOT-26 Mechanical Drawing



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



0D = 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

TSM3900D

20V Dual N-Channel MOSFET

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