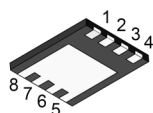


TDFN 3x3



Pin Definition:

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

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (m Ω)	I_D (A)
20	32 @ $V_{GS} = 4.5V$	6.5
	40 @ $V_{GS} = 2.5V$	5.0

Features

- Advance Trench Process Technology
- High Density Cell Design for Ultra Low On-resistance
- ESD Protect 2KV

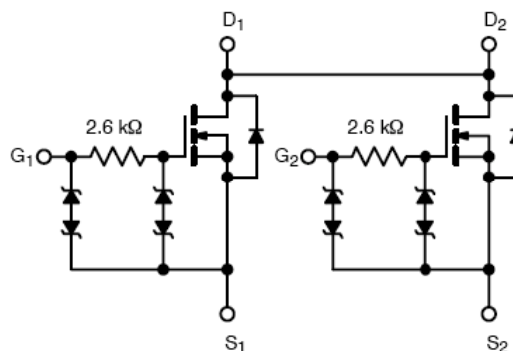
Application

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

Ordering Information

Part No.	Package	Packing
TSM7900DCQ RL	TDFN 3x3	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}	± 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	$T_a = 25^\circ C$	1.25
		$T_a = 75^\circ C$	0.8
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 Foot (Drain) Thermal Resistance	$R_{\theta_{JF}}$	30	$^\circ C/W$
Junction to Ambient Thermal Resistance (PCB mounted)	$R_{\theta_{JA}}$	50	$^\circ C/W$

Notes:

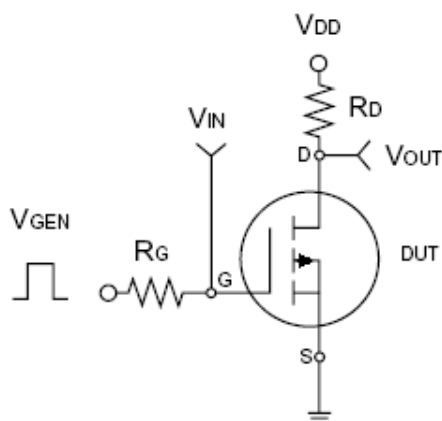
- a. Pulse width limited by the Maximum junction temperature
- b. Surface Mounted on FR4 Board, $t \leq 5$ sec.

Electrical Specifications

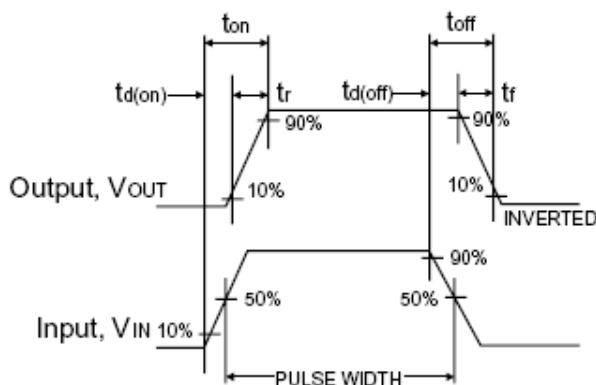
Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	BV_{DSS}	20	--	--	V
Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	$V_{GS(TH)}$	0.6	0.8	1.0	V
Gate Body Leakage	$V_{GS} = \pm 12V, V_{DS} = 0V$	I_{GSS}	--	--	± 100	nA
Zero Gate Voltage Drain Current	$V_{DS} = 16V, V_{GS} = 0V$	I_{DSS}	--	--	1.0	μA
On-State Drain Current	$V_{DS} \leq 5V, V_{GS} = 4.5V$	$I_{D(ON)}$	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}	--	125	--	
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.
- b. Switching time is essentially independent of operating temperature.



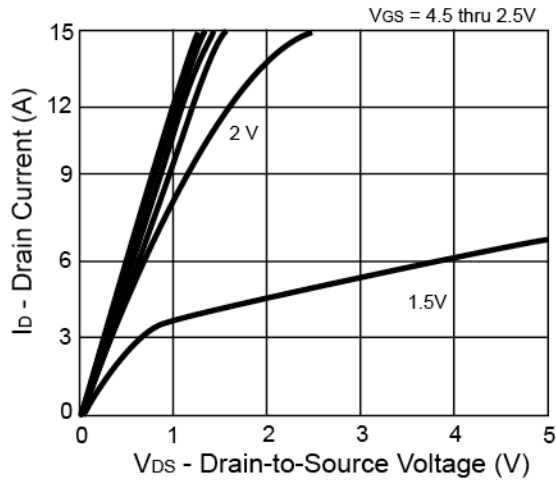
Switching Test Circuit



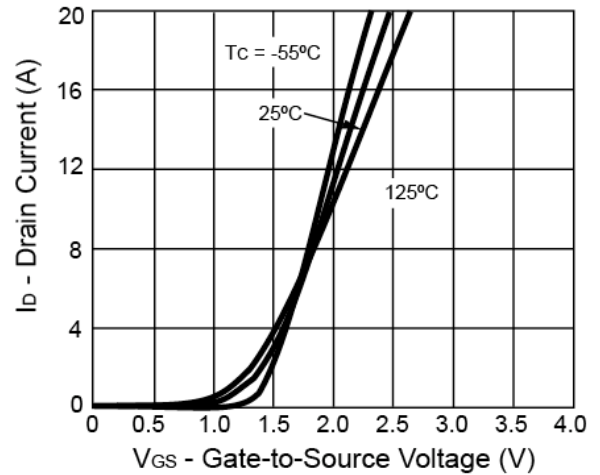
Switchin Waveforms

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

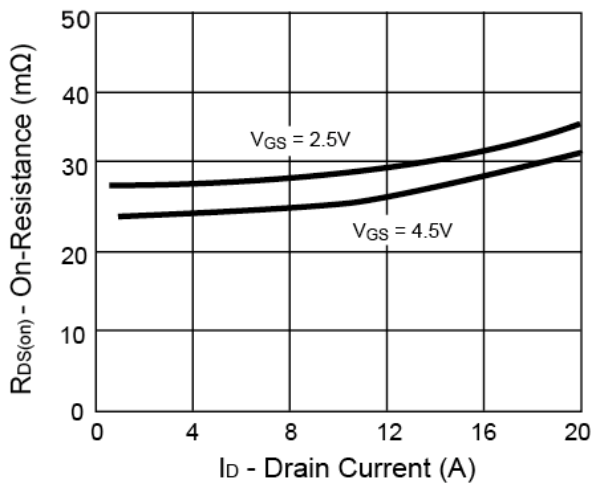
Output Characteristics



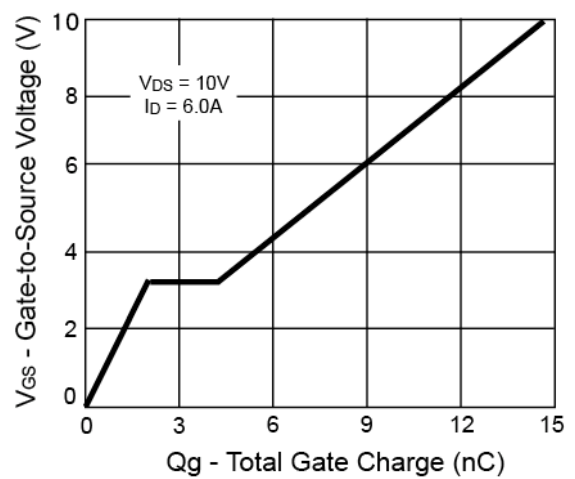
Transfer Characteristics



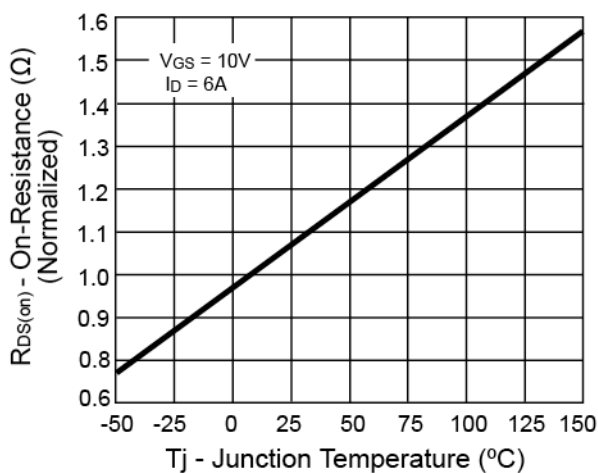
On-Resistance vs. Drain Current



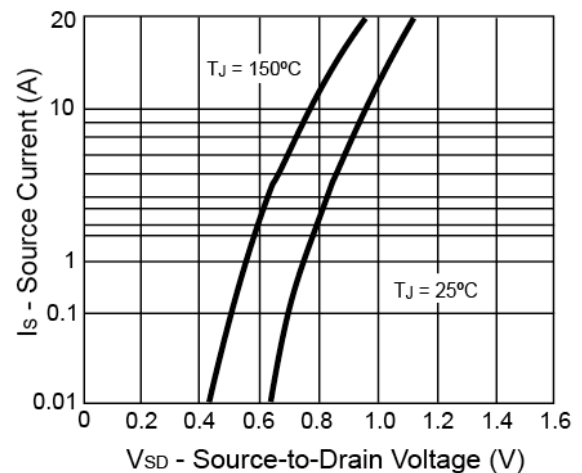
Gate Charge



On-Resistance vs. Junction Temperature

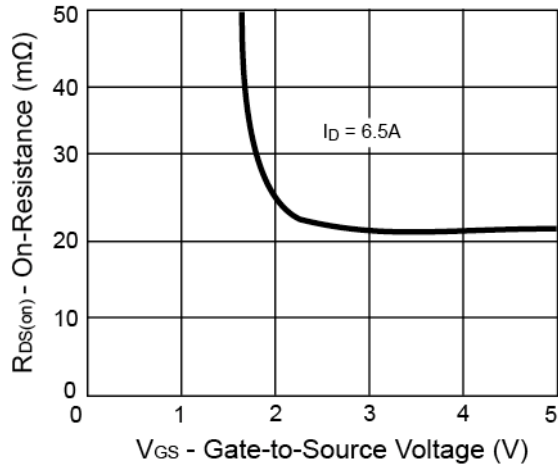


Source-Drain Diode Forward Voltage

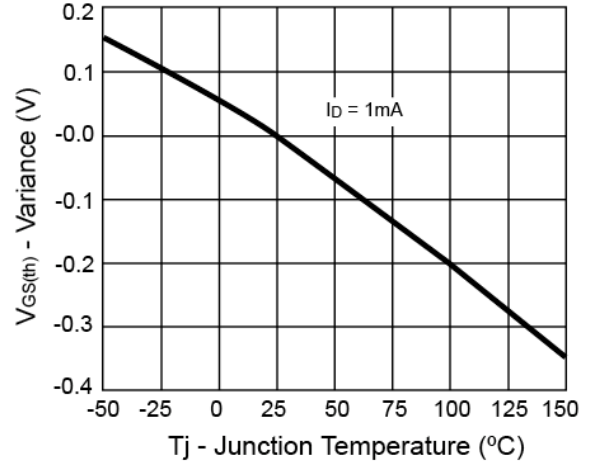


Electrical Characteristics Curve (Ta = 25°C, unless otherwise noted)

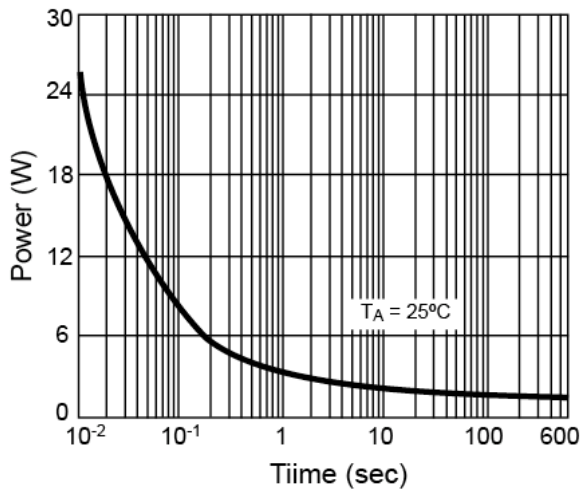
On-Resistance vs. Gate-Source Voltage



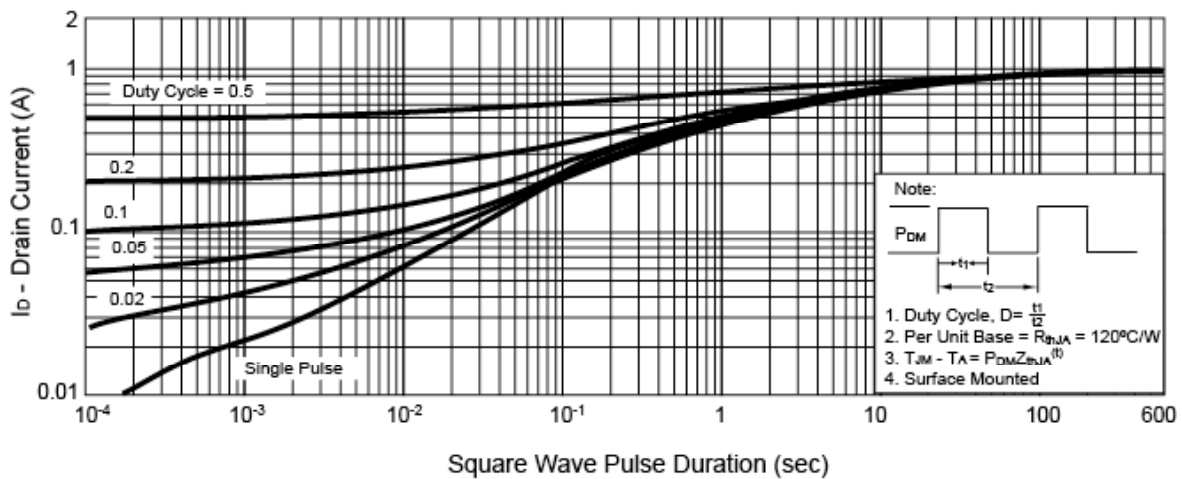
Threshold Voltage



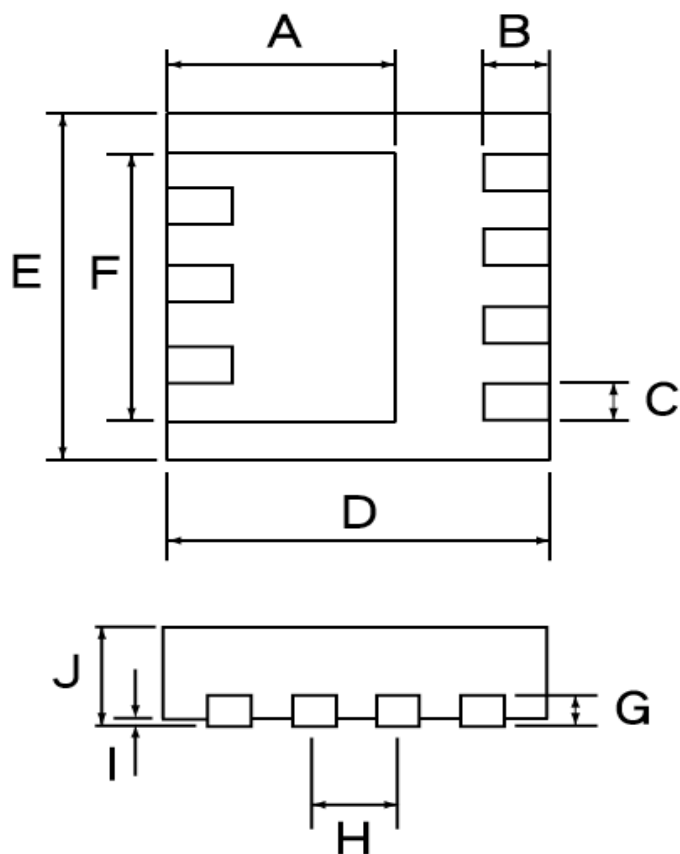
Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient



TDFN Mechanical Drawing



TDFN 3x3 DIMENSION			
DIM	MILLIMETERS		
	MIN.	TYP.	MAX.
A	1.750	1.800	1.850
B	0.470	0.520	0.570
C	0.270	0.320	0.370
D	2.950	3.000	3.050
E	2.950	3.000	3.050
F	2.250	2.300	2.350
G	0.177	0.203	0.280
H	0.610	0.660	0.710
I	0.005	0.020	0.050
J	0.650	0.750	0.850

TSM7900D

20V Dual N-Channel MOSFET w/ESD Protected

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