



TSSOP-8



Pin Definition:

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

TSM6866SD

20V Dual N-Channel MOSFET

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (m Ω)	I_D (A)
20	30 @ $V_{GS} = 4.5V$	6.0
	40 @ $V_{GS} = 2.5V$	5.2

Features

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

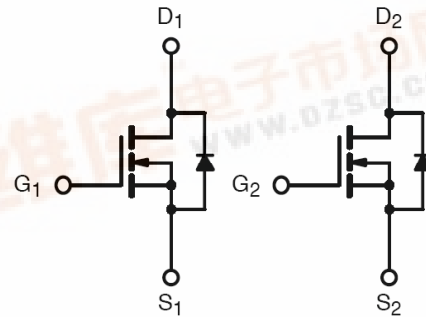
Application

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

Ordering Information

Part No.	Package	Packing
TSM6866SDCA RV	TSSOP-8	3Kpcs / 13" Reel

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	I_D	6	A
Pulsed Drain Current	I_{DM}	30	A
Continuous Source Current (Diode Conduction) ^{a,b}	I_S	1.7	A
Maximum Power Dissipation	P_D	1.6	W
		1.1	
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)	$R_{\theta JA}$	62.5	$^\circ C/W$

Notes:

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



Electrical Specifications (Ta = 25°C unless otherwise noted)

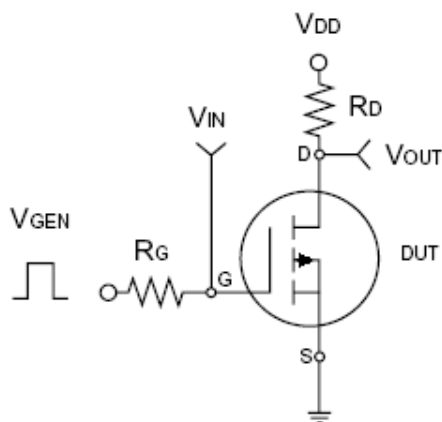
Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	BV_{DSS}	20	--	--	V
Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	$V_{GS(TH)}$	0.6	--	--	V
Gate Body Leakage	$V_{GS} = \pm 12V, V_{DS} = 0V$	I_{GSS}	--	--	± 100	nA
Zero Gate Voltage Drain Current	$V_{DS} = 20V, V_{GS} = 0V$	I_{DSS}	--	--	1.0	μA
On-State Drain Current	$V_{DS} = 5V, V_{GS} = 4.5V$	$I_{D(ON)}$	30	--	--	A
Drain-Source On-State Resistance	$V_{GS} = 4.5V, I_D = 6.0A$	$R_{DS(ON)}$	--	21	30	m Ω
	$V_{GS} = 2.5V, I_D = 5.2A$		--	30	40	
Forward Transconductance	$V_{DS} = 10V, I_D = 6A$	g_{fs}	--	30	--	S
Diode Forward Voltage	$I_S = 1.7A, V_{GS} = 0V$	V_{SD}	--	0.7	1.2	V
Dynamic ^b						
Total Gate Charge	$V_{DS} = 10V, I_D = 6A,$ $V_{GS} = 4.5V$	Q_g	--	5	7	nC
Gate-Source Charge		Q_{gs}	--	1	--	
Gate-Drain Charge		Q_{gd}	--	1.5	--	
Input Capacitance	$V_{DS} = 8V, V_{GS} = 0V,$ $f = 1.0MHz$	C_{iss}	--	565	--	pF
Output Capacitance		C_{oss}	--	105	--	
Reverse Transfer Capacitance		C_{rss}	--	75	--	
Switching ^c						
Turn-On Delay Time	$V_{DD} = 10V, R_L = 10\Omega,$ $I_D = 1A, V_{GEN} = 4.5V,$ $R_G = 6\Omega$	$t_{d(on)}$	--	8	20	nS
Turn-On Rise Time		t_r	--	10	20	
Turn-Off Delay Time		$t_{d(off)}$	--	22	45	
Turn-Off Fall Time		t_f	--	6	15	

Notes:

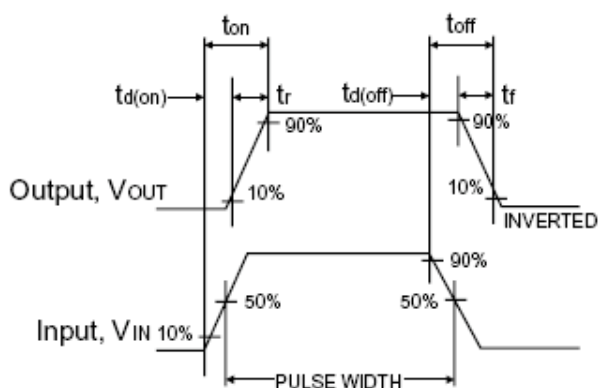
a. pulse test: $PW \leq 300\mu s$, duty cycle $\leq 2\%$

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

b. Switching time is essentially independent of operating temperature.



Switching Test Circuit



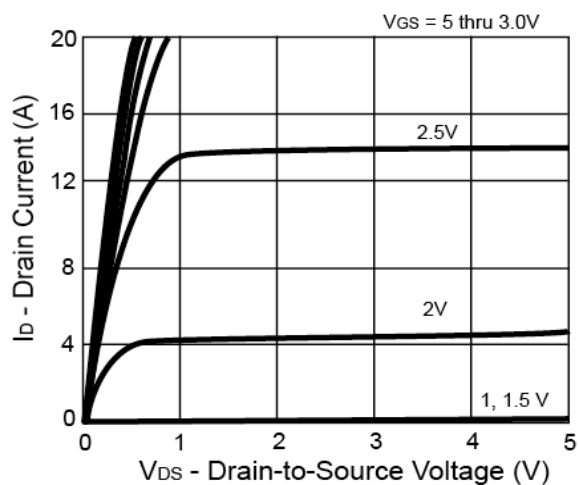
Switchin Waveforms

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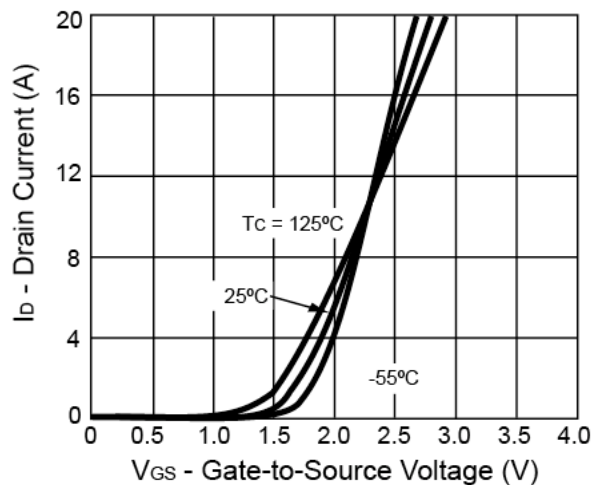
20V Dual N-Channel MOSFET

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

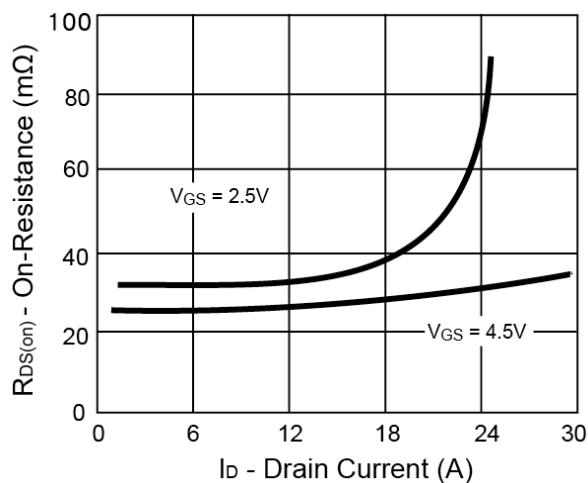
Output Characteristics



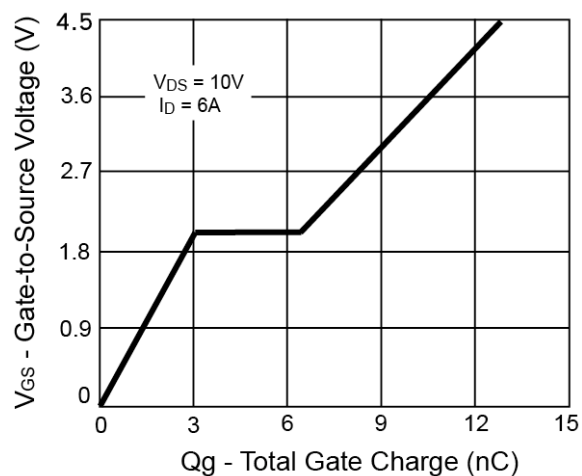
Transfer Characteristics



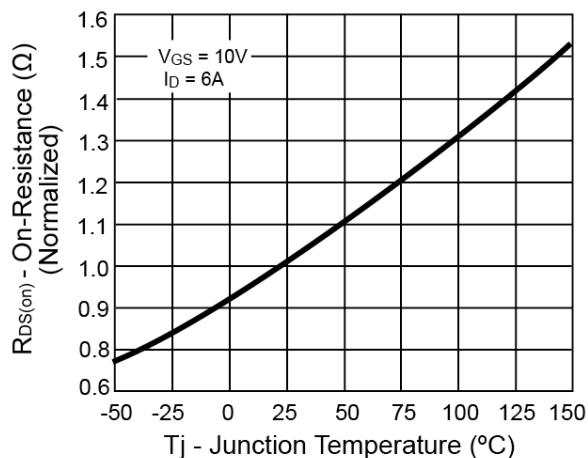
On-Resistance vs. Drain Current



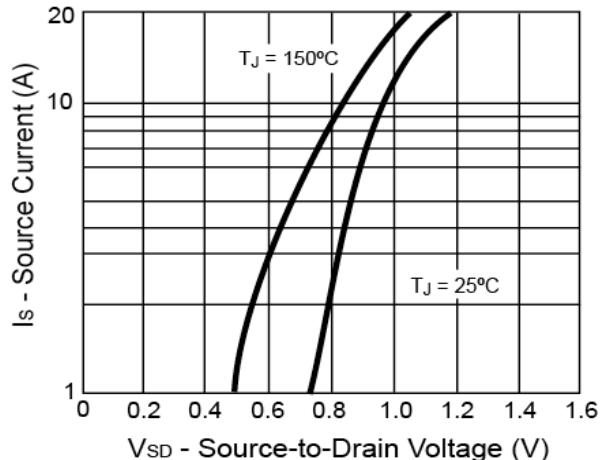
Gate Charge



On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage

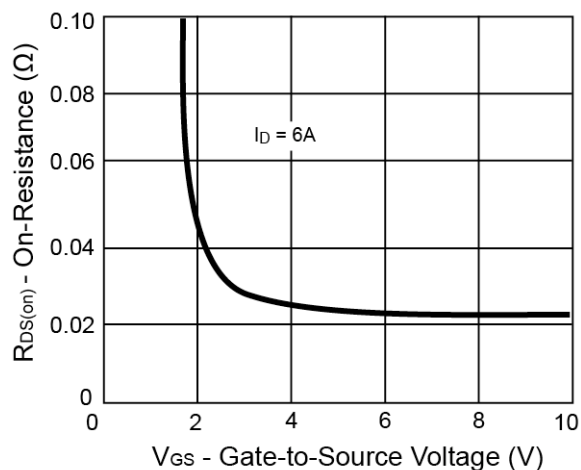


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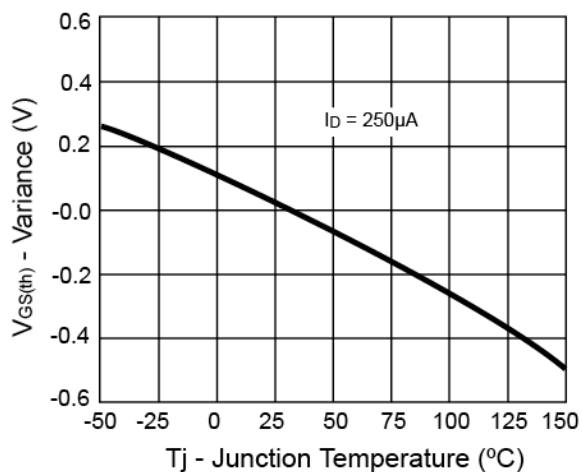
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Electrical Characteristics Curve ($T_A = 25^\circ\text{C}$, unless otherwise noted)

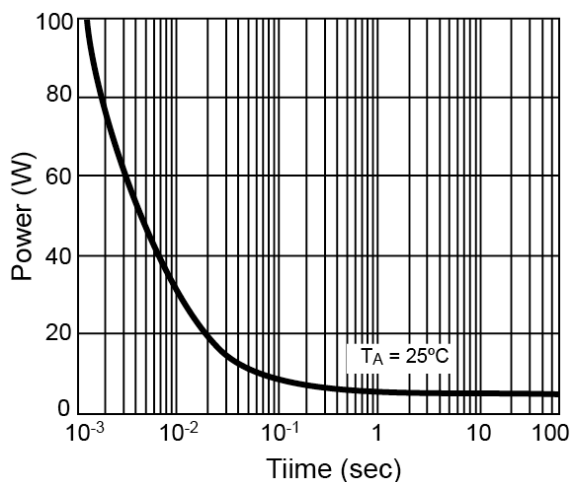
On-Resistance vs. Gate-Source Voltage



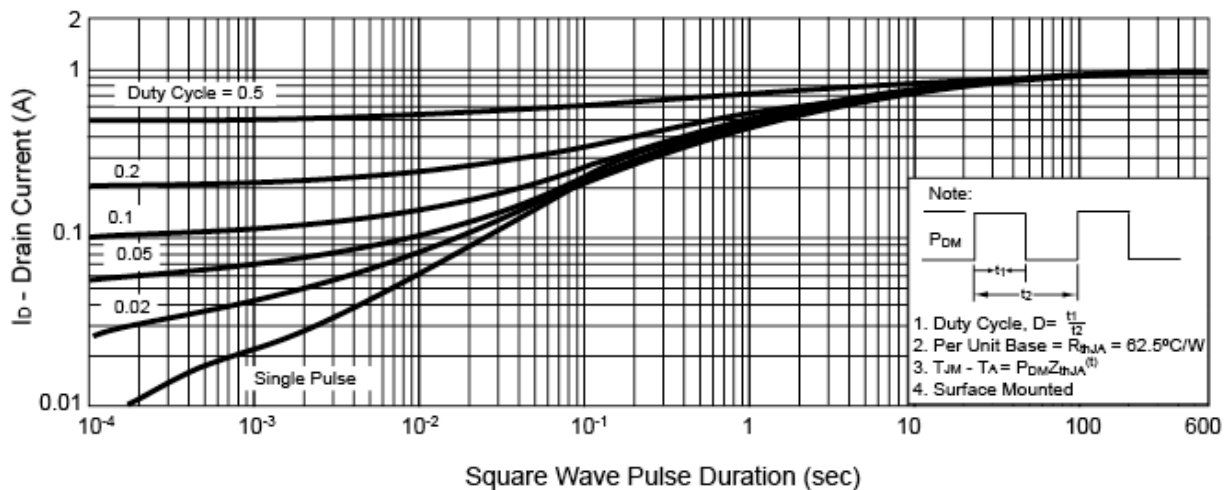
Threshold Voltage



Single Pulse Power



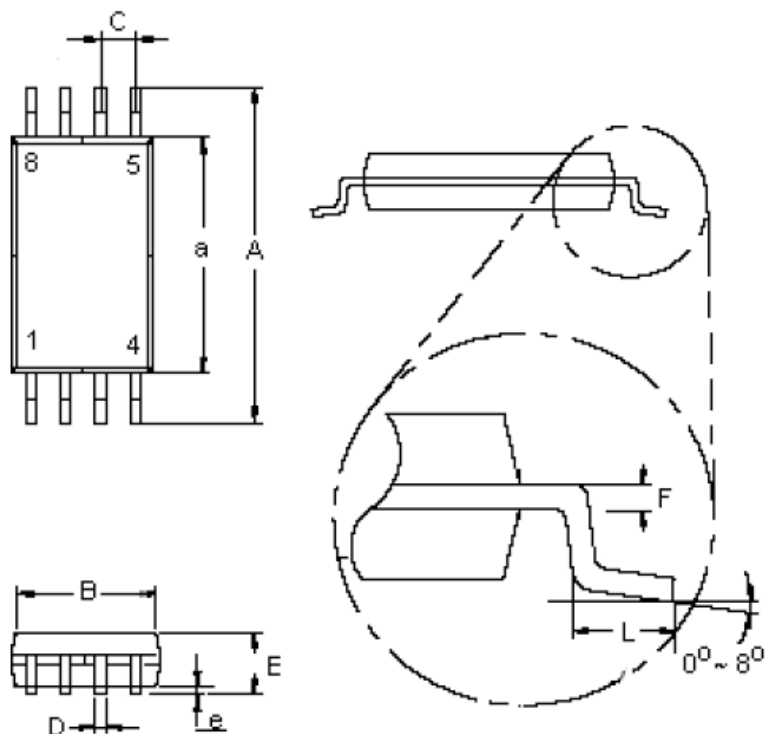
Normalized Thermal Transient Impedance, Junction-to-Ambient



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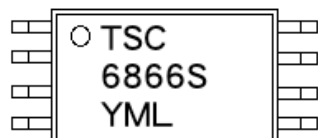
20V Dual N-Channel MOSFET

TSSOP-8 Mechanical Drawing



TSSOP-8 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	6.20	6.60	0.244	0.260
a	4.30	4.50	0.170	0.177
B	2.90	3.10	0.114	0.122
C	0.65 (typ)		0.025 (typ)	
D	0.25	0.30	0.010	0.019
E	1.05	1.20	0.041	0.049
e	0.05	0.15	0.002	0.009
F	0.127		0.005	
L	0.50	0.70	0.020	0.028

Marking Diagram



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



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