
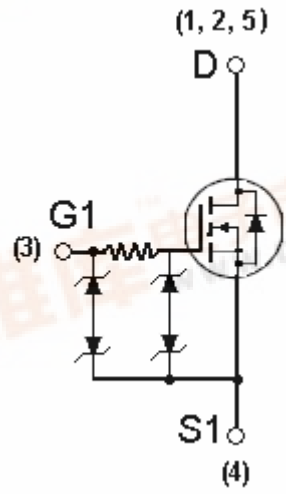
	<h1>TSM3461CX5</h1> <h2>20V N-Channel MOSFET w/ESD Protected</h2>								
 <p><b>SOT-25</b></p> <p>Pin assignment:                  1. Drain    5. Drain                  2. Drain                  3. Gate    4. Source</p>	<p><b>V<sub>DS</sub> = 20V</b></p> <p><b>R<sub>DS(on)</sub>, V<sub>GS</sub> @ 4.5V, I<sub>DS</sub> @ 6A = 22mΩ (typ.)</b></p> <p><b>R<sub>DS(on)</sub>, V<sub>GS</sub> @ 2.5V, I<sub>DS</sub> @ 5A = 35mΩ (typ.)</b></p>								
<p><b>Features</b></p> <ul style="list-style-type: none"> <li>✧ Advanced trench process technology</li> <li>✧ High density cell design for ultra low on-resistance</li> <li>✧ Excellent thermal and electrical capabilities</li> <li>✧ Specially designed for Li-ion battery packs.</li> <li>✧ Battery switch application</li> </ul>	<p><b>Block Diagram</b></p> 								
<p><b>Ordering Information</b></p> <table border="1" data-bbox="172 1048 758 1191"> <thead> <tr> <th>Part No.</th> <th>Packing</th> <th>Package</th> </tr> </thead> <tbody> <tr> <td>TSM3461CX5 RF</td> <td>Tape &amp; Reel 3,000/per reel</td> <td>SOT-25</td> </tr> </tbody> </table>	Part No.	Packing	Package	TSM3461CX5 RF	Tape & Reel 3,000/per reel	SOT-25			
Part No.	Packing	Package							
TSM3461CX5 RF	Tape & Reel 3,000/per reel	SOT-25							
<p><b>Absolute Maximum Rating</b> (Ta = 25 °C unless otherwise noted)</p>									
<p><b>Parameter</b></p>	<p><b>Symbol</b></p>	<p><b>Limit</b></p>	<p><b>Unit</b></p>						
<p>Drain-Source Voltage</p>	<p>V<sub>DS</sub></p>	<p>20V</p>	<p>V</p>						
<p>Gate-Source Voltage</p>	<p>V<sub>GS</sub></p>	<p>± 12</p>	<p>V</p>						
<p>Continuous Drain Current, V<sub>GS</sub> @4.5V.</p>	<p>Ta = 25 °C</p>	<p>I<sub>D</sub></p>	<p>6</p>						
	<p>Ta = 70 °C</p>	<p>I<sub>D</sub></p>	<p>5</p>						
<p>Pulsed Drain Current, V<sub>GS</sub> @4.5V</p>	<p>I<sub>DM</sub></p>	<p>30</p>	<p>A</p>						
<p>Diode Forward Current</p>	<p>I<sub>S</sub></p>	<p>1.5</p>	<p>A</p>						
<p>Maximum Power Dissipation</p>	<p>Ta = 25 °C</p>	<p>P<sub>D</sub></p>	<p>1.3</p>						
	<p>Ta = 70 °C</p>	<p></p>	<p>0.96</p>						
<p>Operating Junction and Storage Temperature Range</p>	<p>T<sub>J</sub>, T<sub>STG</sub></p>	<p>- 55 to +150</p>	<p>°C</p>						
<p><b>Thermal Performance</b></p>									
<p><b>Parameter</b></p>	<p><b>Symbol</b></p>	<p><b>Limit</b></p>	<p><b>Unit</b></p>						
<p>Junction to Foot (Drain) Thermal Resistance</p>	<p>R<sub>θjf</sub></p>	<p>35</p>	<p>°C/W</p>						
<p>Junction to Ambient Thermal Resistance (PCB mounted)</p>	<p>R<sub>θja</sub></p>	<p>120</p>	<p>°C/W</p>						

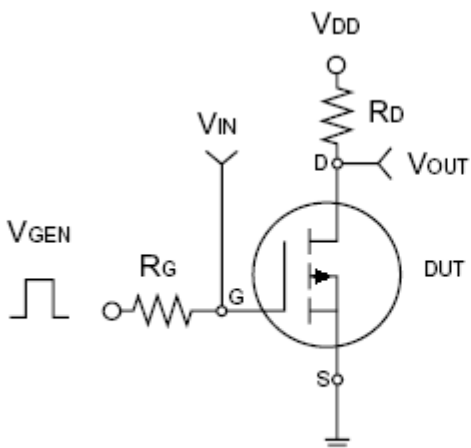
Note: Surface mounted on FR4 board t<=300uS, Duty < 2%.



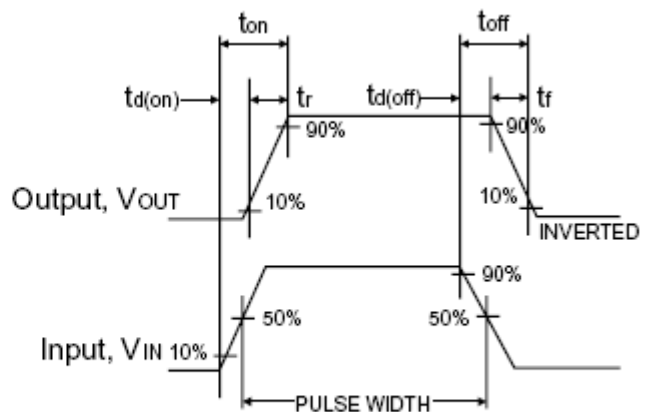


Electrical Characteristics							
T <sub>j</sub> = 25 °C unless otherwise noted							
Parameter	Conditions	Symbol	Min	Typ	Max	Unit	
<b>Static</b>							
Drain-Source Breakdown Voltage	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250uA	BV <sub>DSS</sub>	20	--	--	V	
Drain-Source On-State Resistance	V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 6A	R <sub>DS(ON)</sub>	--	25	30	mΩ	25 °C
	V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 6A						60 °C
Drain-Source On-State Resistance	V <sub>GS</sub> = 2.5V, I <sub>D</sub> = 5A	R <sub>DS(ON)</sub>	--	35	45	mΩ	
Gate Threshold Voltage	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250uA	V <sub>GS(TH)</sub>	0.5	0.85	--	V	
Zero Gate Voltage Drain Current	V <sub>DS</sub> = 12V, V <sub>GS</sub> = 0V	I <sub>DSS</sub>	--	--	1.0	uA	
	V <sub>DS</sub> = 12V, V <sub>GS</sub> = 0V, T <sub>j</sub> = 60 °C						25
Gate Body Leakage	V <sub>GS</sub> = ± 12V, V <sub>DS</sub> = 0V	I <sub>GSS</sub>	--	--	± 100	nA	
On-State Drain Current	V <sub>GS</sub> = 4.5V, V <sub>DS</sub> >= 5V	I <sub>D(ON)</sub>	30	--	--	A	
Forward Transconductance	V <sub>DS</sub> = 10V, I <sub>D</sub> = 6A	g <sub>fs</sub>	--	30	--	S	
<b>Dynamic *</b>							
Total Gate Charge	V <sub>DS</sub> = 10V, I <sub>D</sub> = 6A, V <sub>GS</sub> = 4.5V	Q <sub>g</sub>	--	15.5	30	nC	
Gate-Source Charge		Q <sub>gs</sub>	--	2	--		
Gate-Drain Charge		Q <sub>gd</sub>	--	3.5	--		
Turn-On Delay Time	V <sub>DD</sub> = 10V, R <sub>L</sub> = 10Ω, I <sub>D</sub> = 1A, V <sub>GEN</sub> = 4.5V, R <sub>G</sub> = 6Ω	t <sub>d(on)</sub>	--	75	100	nS	
Turn-On Rise Time		t <sub>r</sub>	--	125	150		
Turn-Off Delay Time		t <sub>d(off)</sub>	--	600	720		
Turn-Off Fall Time		t <sub>f</sub>	--	300	360		
Input Capacitance	V <sub>DS</sub> = 10V, V <sub>GS</sub> = 0V, f = 1.0MHz	C <sub>iss</sub>	--	1336	--	pF	
Output Capacitance		C <sub>oss</sub>	--	220	--		
Reverse Transfer Capacitance		C <sub>rss</sub>	--	130	--		
<b>Source-Drain Diode</b>							
Max. Diode Forward Current		I <sub>S</sub>	--	--	1.5	A	
Diode Forward Voltage	I <sub>S</sub> = 1.5A, V <sub>GS</sub> = 0V	V <sub>SD</sub>	--	0.6	1.2	V	

Note : \* for design only, not subject to production tested.  
pulse test: pulse width <=300uS, duty cycle <=2%



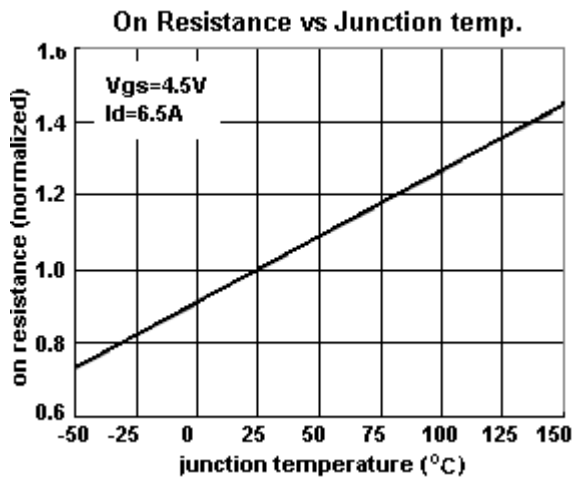
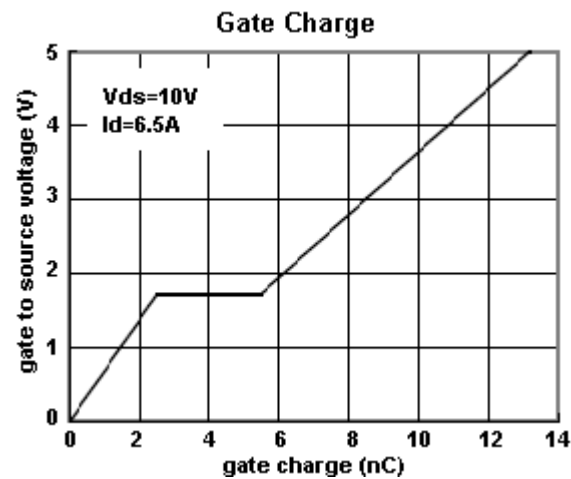
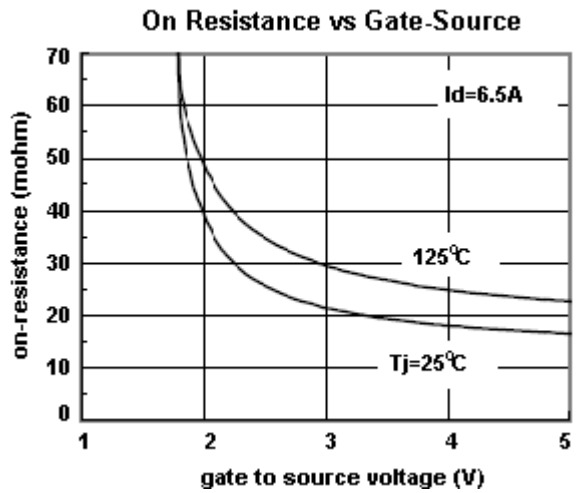
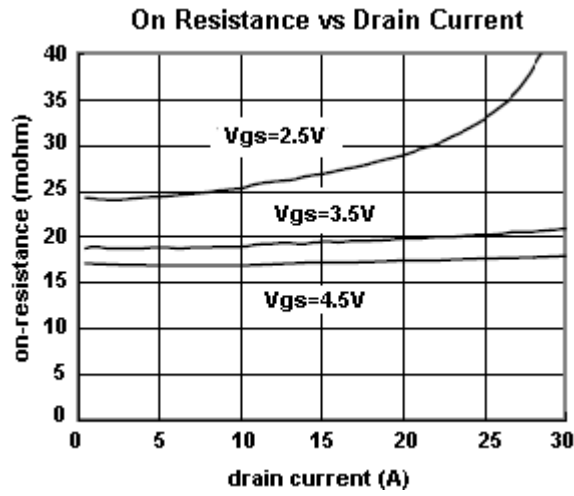
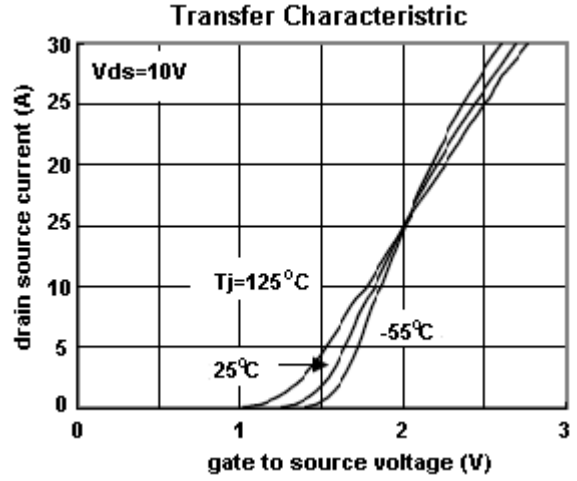
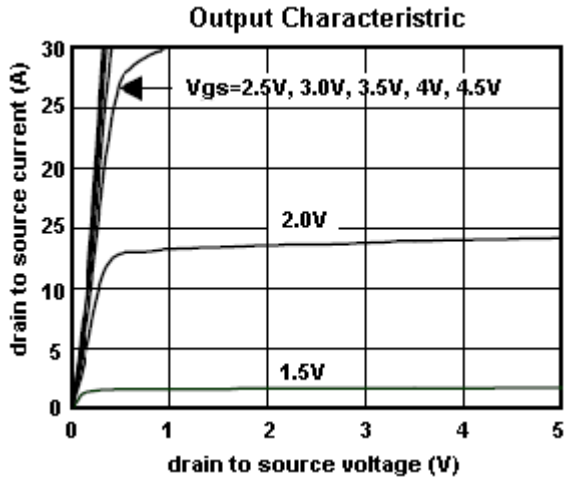
Switching Test Circuit



Switchin Waveforms

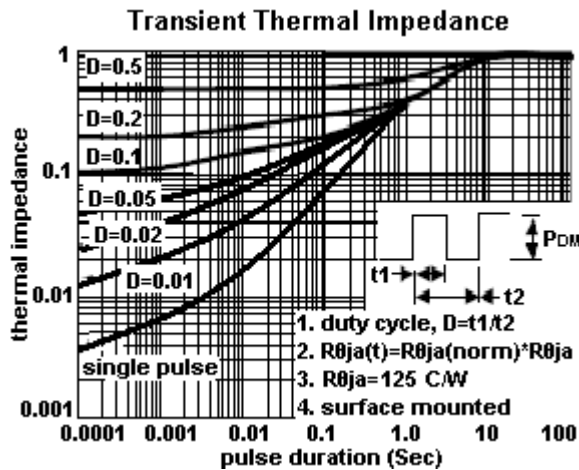
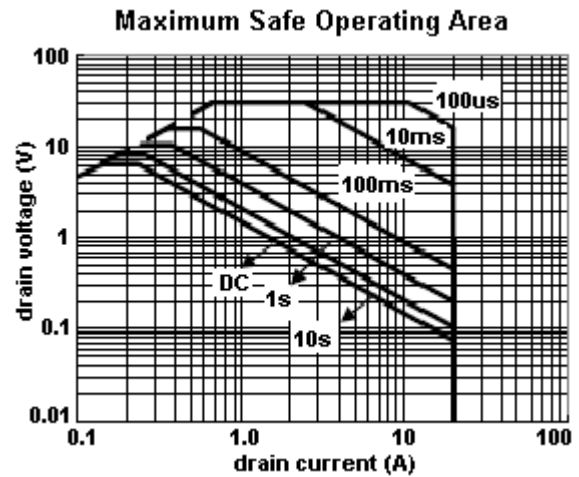
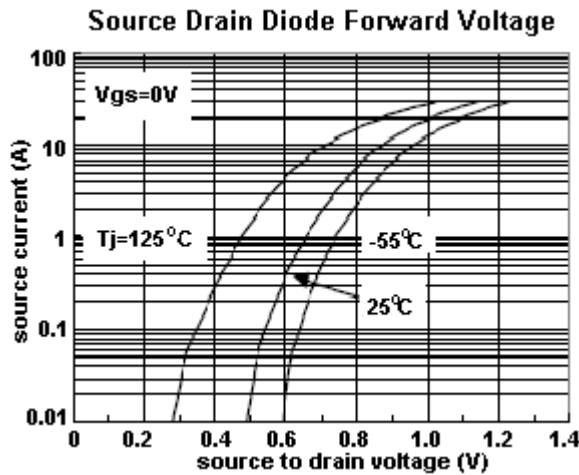
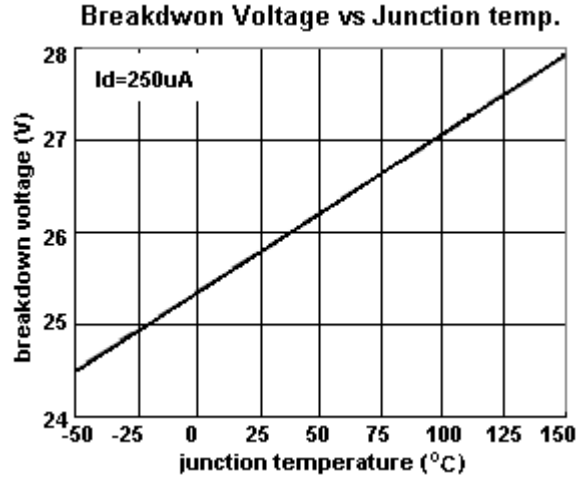
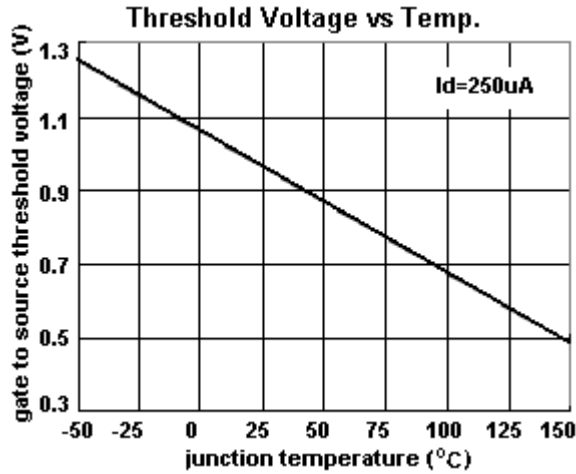


**Typical Characteristics Curve** ( $T_a = 25^\circ\text{C}$  unless otherwise noted)



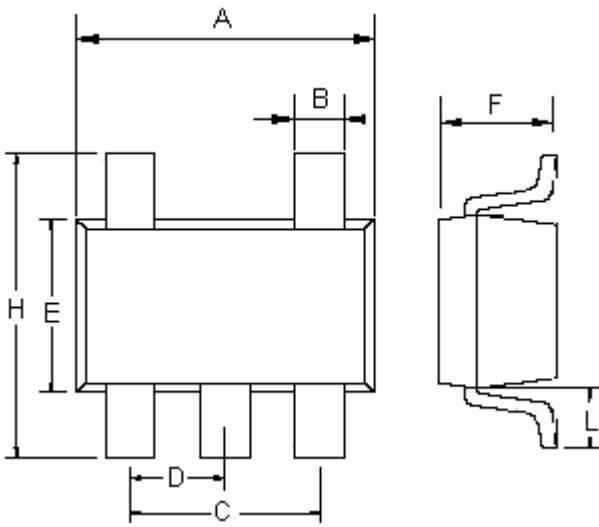


## Electrical Characteristics Curve (continued)





## SOT-25 Mechanical Drawing



SOT-25 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.70	3.00	0.106	0.118
B	0.25	0.50	0.010	0.020
C	1.90(typ)		0.075(typ)	
D	0.95(typ)		0.037(typ)	
E	1.50	1.70	0.059	0.067
F	1.00	1.2	0.040	0.047
H	2.60	3.00	0.102	0.118
L	0.60(typ)		0.024(typ)	