



# THE DATASHEET OF TSM3457CX6 RFG





### SOT-26



### Pin Definition:

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

### Key Parameter Performance

Parameter	Value	Unit
$V_{DS}$	-30	V
$R_{DS(on)}$ (max)	$V_{GS} = -10V$	60
	$V_{GS} = -4.5V$	100
$Q_g$	9.52	nC

### Features

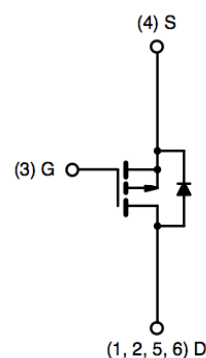
- Advance Trench Process Technology
- High Density Cell Design for Ultra Low On-resistance

### Ordering Information

Part No.	Package	Packing
TSM3457CX6 RFG	SOT-26	3kpcs / 7" Reel

**Note:** "G" denotes for Halogen- and Antimony-free as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds

### Block Diagram



P-Channel MOSFET

### Absolute Maximum Ratings ( $T_A = 25^\circ C$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	$V_{DS}$	-30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current	$I_D$	-5	A
Pulsed Drain Current	$I_{DM}$	-20	A
Continuous Source Current (Diode Conduction) <sup>(Note 1,2)</sup>	$I_S$	-1.7	A
Maximum Power Dissipation	$P_D$	$T_A = 25^\circ C$	2.0
		$T_A = 70^\circ C$	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	$^\circ C/W$

### Electrical Specifications (T<sub>A</sub> = 25°C unless otherwise noted)

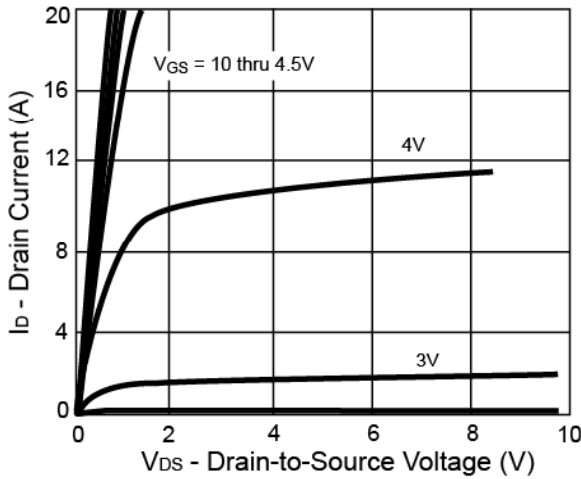
Parameter	Conditions	Symbol	Min	Typ	Max	Unit
<b>Static</b> (Note 3)						
Drain-Source Breakdown Voltage	V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA	BV <sub>DSS</sub>	-30	--	--	V
Gate Threshold Voltage	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA	V <sub>GS(TH)</sub>	-1.0	-1.5	-3.0	V
Gate Body Leakage	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V	I <sub>GSS</sub>	--	--	±100	nA
Zero Gate Voltage Drain Current	V <sub>DS</sub> = -24V, V <sub>GS</sub> = 0V	I <sub>DSS</sub>	--	--	-1.0	μA
On-State Drain Current	V <sub>DS</sub> = -5V, V <sub>GS</sub> = -10V	I <sub>D(ON)</sub>	-20	--	--	A
Drain-Source On-State Resistance	V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -3.7A	R <sub>DS(ON)</sub>	--	82	100	mΩ
	V <sub>GS</sub> = -10V, I <sub>D</sub> = -5A		--	50	60	
Forward Transconductance	V <sub>DS</sub> = -15V, I <sub>D</sub> = -5A	g <sub>fs</sub>	--	10	--	S
Diode Forward Voltage	I <sub>S</sub> = -1.7A, V <sub>GS</sub> = 0V	V <sub>SD</sub>	--	-0.8	-1.2	V
<b>Dynamic</b> (Note 4,5)						
Total Gate Charge	V <sub>DS</sub> = -15V, I <sub>D</sub> = -3.7A, V <sub>GS</sub> = -10V	Q <sub>g</sub>	--	9.52	--	nC
Gate-Source Charge		Q <sub>gs</sub>	--	3.43	--	
Gate-Drain Charge		Q <sub>gd</sub>	--	1.71	--	
Input Capacitance	V <sub>DS</sub> = -15V, V <sub>GS</sub> = 0V, f = 1.0MHz	C <sub>iss</sub>	--	551.57	--	pF
Output Capacitance		C <sub>oss</sub>	--	90.96	--	
Reverse Transfer Capacitance		C <sub>rss</sub>	--	60.79	--	
<b>Switching</b> (Note 4,5)						
Turn-On Delay Time	V <sub>DD</sub> = -15V, R <sub>L</sub> = 15Ω, I <sub>D</sub> = -1A, V <sub>GEN</sub> = -10V, R <sub>G</sub> = 6Ω	t <sub>d(on)</sub>	--	10.8	--	ns
Turn-On Rise Time		t <sub>r</sub>	--	2.33	--	
Turn-Off Delay Time		t <sub>d(off)</sub>	--	22.53	--	
Turn-Off Fall Time		t <sub>f</sub>	--	3.87	--	

#### Notes:

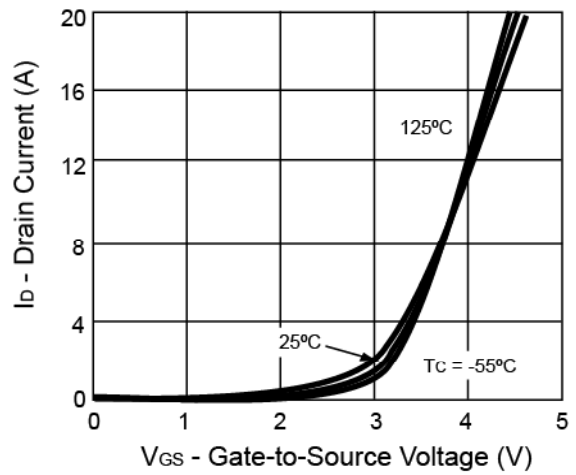
1. Pulse width limited by the Maximum junction temperature
2. Surface Mounted on FR4 Board, t ≤ 5 sec.
3. pulse test: PW ≤ 300μS, duty cycle ≤ 2%
4. For DESIGN AID ONLY, not subject to production testing.
5. Switching time is essentially independent of operating temperature.

### Electrical Characteristics Curves

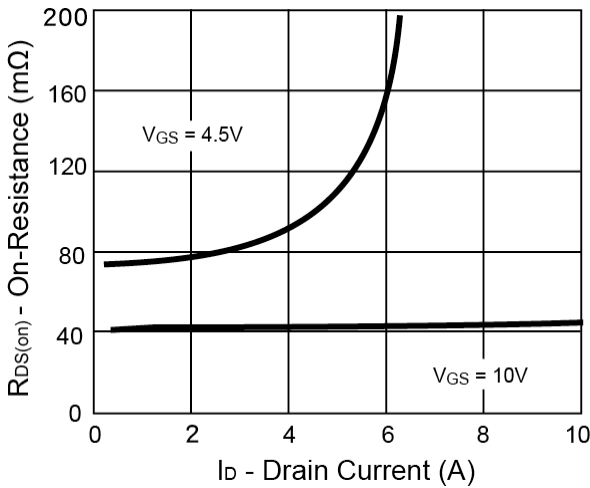
**Output Characteristics**



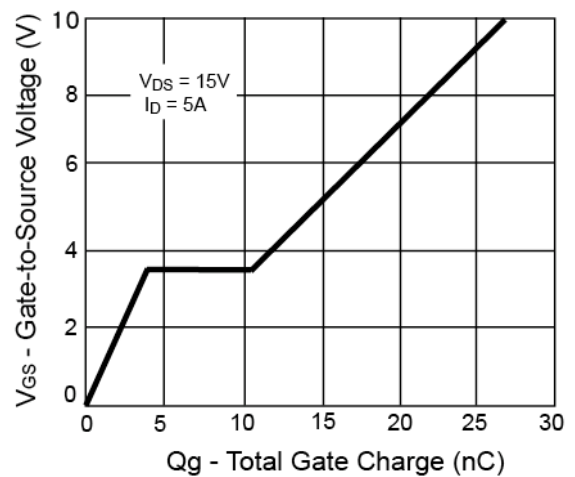
**Transfer Characteristics**



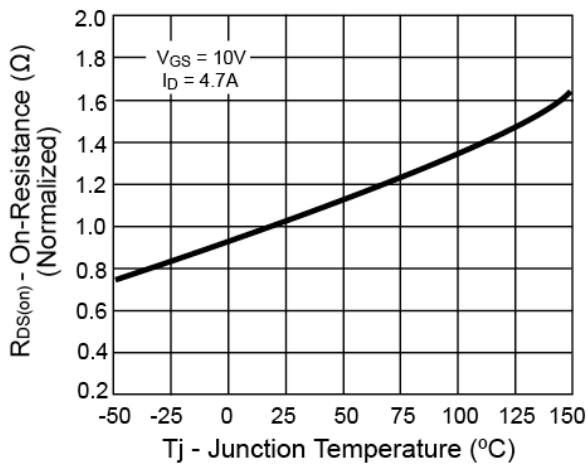
**On-Resistance vs. Drain Current**



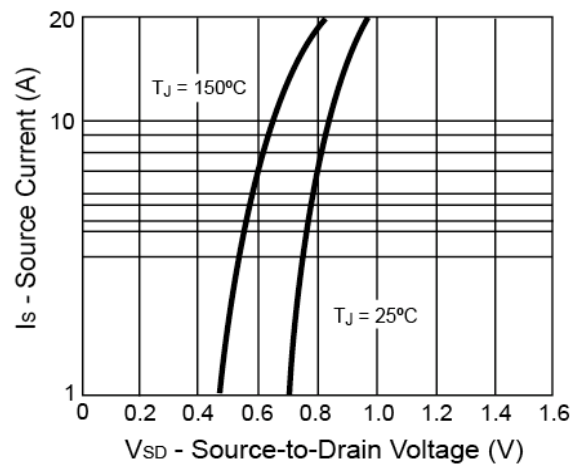
**Gate Charge**



**On-Resistance vs. Junction Temperature**

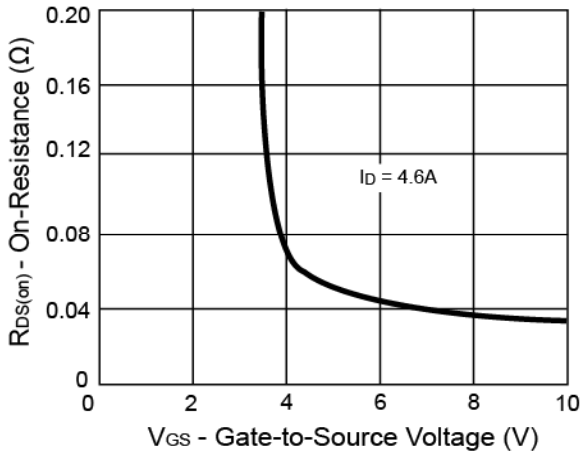


**Source-Drain Diode Forward Voltage**

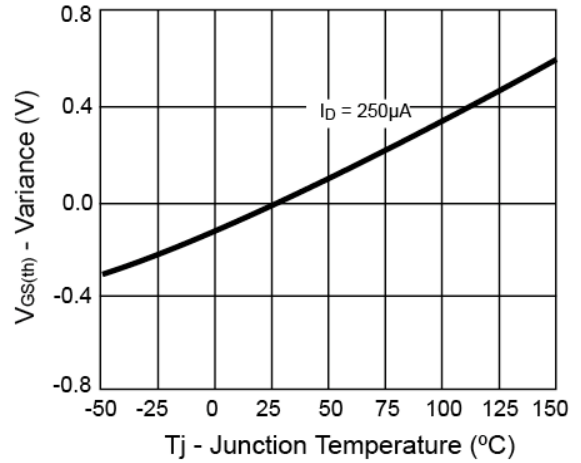


### Electrical Characteristics Curves

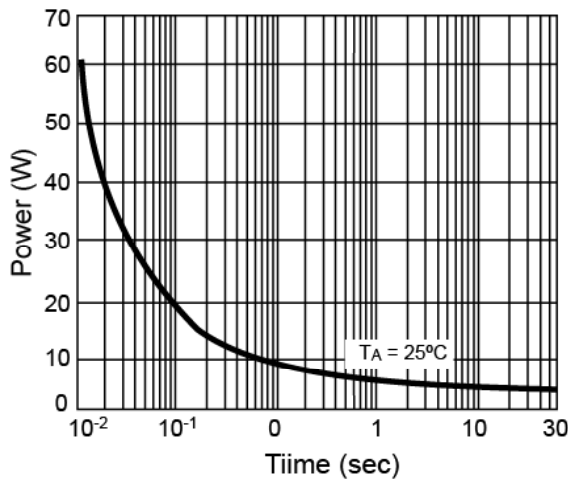
**On-Resistance vs. Gate-Source Voltage**



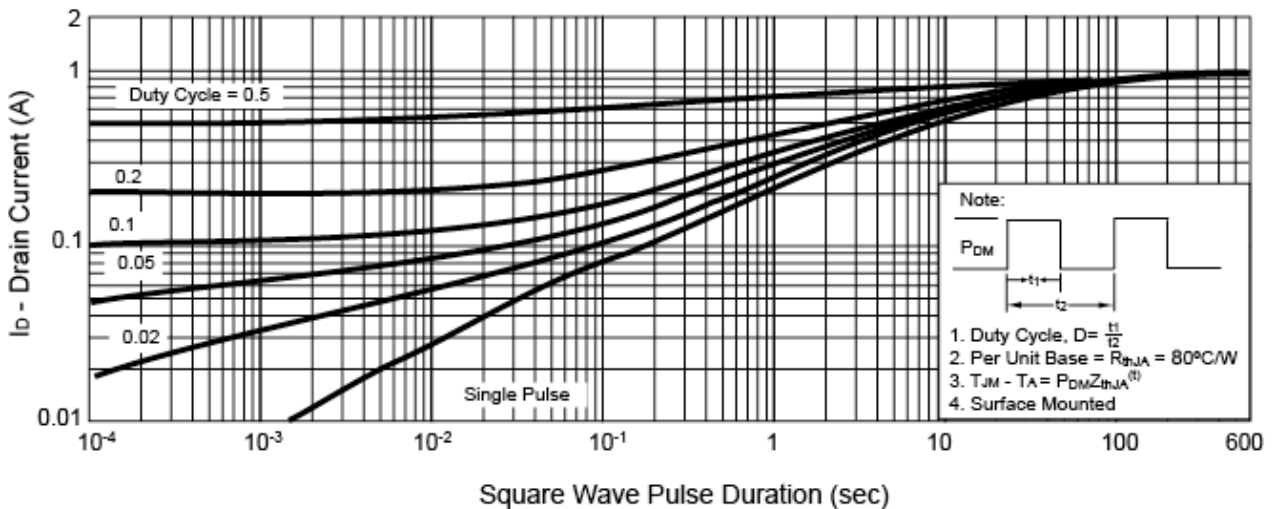
**Threshold Voltage**



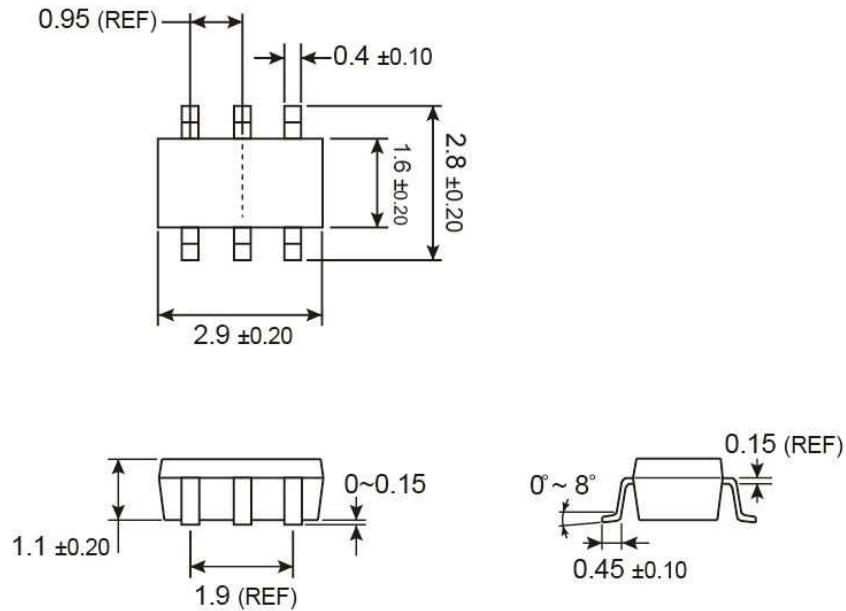
**Single Pulse Power**



**Normalized Thermal Transient Impedance, Junction-to-Ambient**

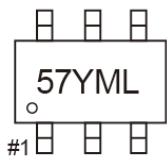


**SOT-26 Mechanical Drawing**



Unit: Millimeters

**Marking Diagram**



- 57** = Device Code
- Y** = Year Code
- M** = Month Code for Halogen Free Product
  - O** =Jan    **P** =Feb    **Q** =Mar    **R** =Apr
  - S** =May    **T** =Jun    **U** =Jul    **V** =Aug
  - W** =Sep    **X** =Oct    **Y** =Nov    **Z** =Dec
- L** = Lot Code

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