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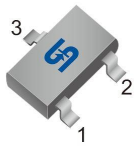
TSM650P03CX

30V P-Channel Power MOSFET

Pb-Free RoHS COMPLIANT

SOT-23



Pin Definition:
1. Gate
2. Source
3. Drain

Key Parameter Performance

Parameter		Value	Unit
V_{DS}		-30	V
$R_{DS(on)}$ (max)	V_{GS} =- 10V	65	m Ω
	V_{GS} = -4.5V	75	
	V_{GS} = -2.5V	100	
Q_g		8	nC

Features

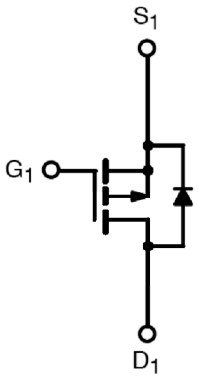
- Fast Switching
- Suited for -2.5V Gate Drive Applications
- Halogen-free

Ordering Information

Part No.	Package	Packing
TSM650P03CX RFG	SOT-23	3kcs / 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_C = 25°C unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	-30	V
Gate-Source Voltage		V_{GS}	±12	V
Continuous Drain Current	T_C = 25°C	I_D	-4.1	A
	T_C = 100°C		-2.6	A
Pulsed Drain Current (Note 1)		I_{DM}	-16.4	A
Power Dissipation @ T_C = 25°C		P_D	1.56	W
Operating Junction Temperature		T_J	150	°C
Storage Temperature Range		T_{STG}	-55 to +150	°C

Thermal Performance

Parameter	Symbol	Limit	Unit
Thermal Resistance - Junction to Ambient	$R_{\theta JA}$	80	°C/W

Pb-Free RoHS COMPLIANT

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

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = -250μA	BV_{DSS}	-30	--	--	V
Drain-Source On-State Resistance	V_{GS} = -10V, I_D = -4A	$R_{DS(on)}$	--	55	65	mΩ
	V_{GS} = -4.5V, I_D = -3A		--	65	75	
	V_{GS} = -2.5V, I_D = -2A		--	85	100	
Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = -250μA	$V_{GS(TH)}$	-0.4	-0.7	-0.9	V
Zero Gate Voltage Drain Current	V_{DS} = -30V, V_{GS} = 0V	I_{DSS}	--	--	-1	μA
	V_{DS} = -24V, T_J = 125°C		--	--	-10	
Gate Body Leakage	V_{GS} = ±12V, V_{DS} = 0V	I_{GSS}	--	--	±100	nA
Forward Transconductance (Note 2)	V_{DS} = -10V, I_D = -3A	g_{fs}	--	5.4	--	S
Dynamic						
Total Gate Charge (Note 2,3)	V_{DS} = -15V, I_D = -4A, V_{GS} = -4.5V	Q_g	--	8	--	nC
Gate-Source Charge (Note 2,3)		Q_{gs}	--	1.9	--	
Gate-Drain Charge (Note 2,3)		Q_{gd}	--	1.4	--	
Input Capacitance	V_{DS} = -15V, V_{GS} = 0V, f = 1.0MHz	C_{iss}	--	810	--	pF
Output Capacitance		C_{oss}	--	85	--	
Reverse Transfer Capacitance		C_{rss}	--	50	--	
Switching						
Turn-On Delay Time (Note 2,3)	V_{DD} = -15V, I_D = -1A, V_{GS} = -10V, R_{GEN} = 6Ω	$t_{d(on)}$	--	5.4	--	ns
Turn-On Rise Time (Note 2,3)		t_r	--	19.4	--	
Turn-Off Delay Time (Note 2,3)		$t_{d(off)}$	--	45.9	--	
Turn-Off Fall Time (Note 2,3)		t_f	--	12.4	--	
Source-Drain Diode Ratings and Characteristic						
Maximum Continuous Drain-Source Diode Forward Current	Integral reverse diode in the MOSFET	I_S	--	--	-4.1	A
Maximum Pulse Drain-Source Diode Forward Current		I_{SM}	--	--	-16.4	A
Diode-Source Forward Voltage	V_{GS} = 0V, I_S = -1A	V_{SD}	--	--	-1	V

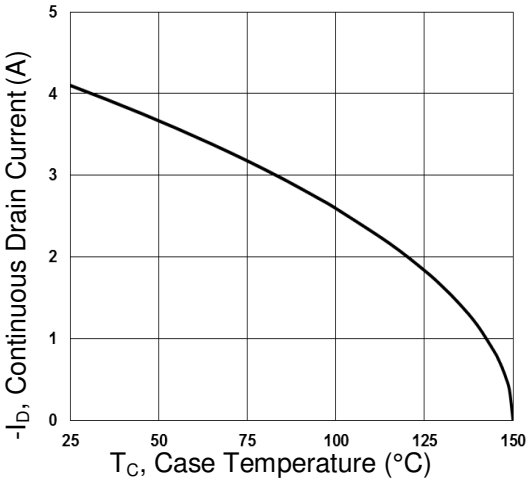
Note:

1. Pulse width limited by safe operating area
2. Pulse test: pulse width ≤300μs, duty cycle ≤2%
3. Switching time is essentially independent of operating temperature.

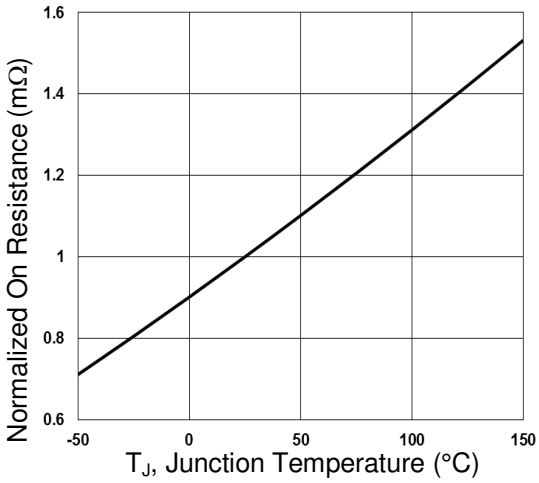
Pb-Free RoHS COMPLIANT

Electrical Characteristics Curve

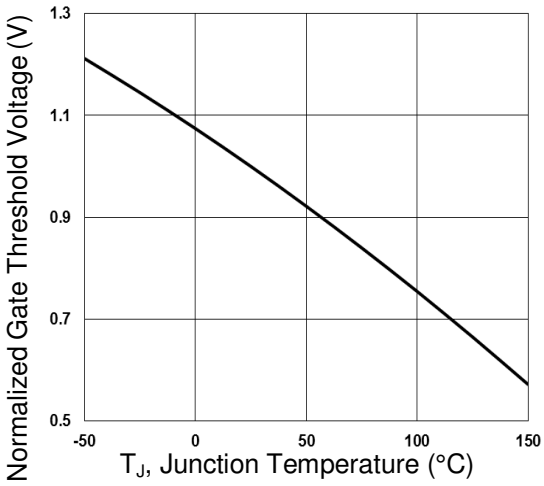
Continuous Drain Current vs. T_C



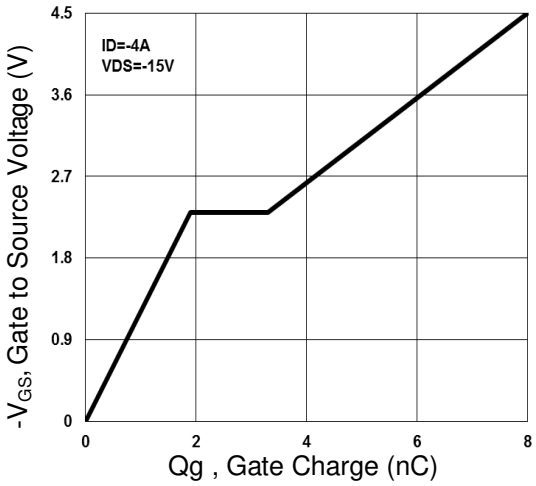
Normalized $R_{DS}(on)$ vs. T_J



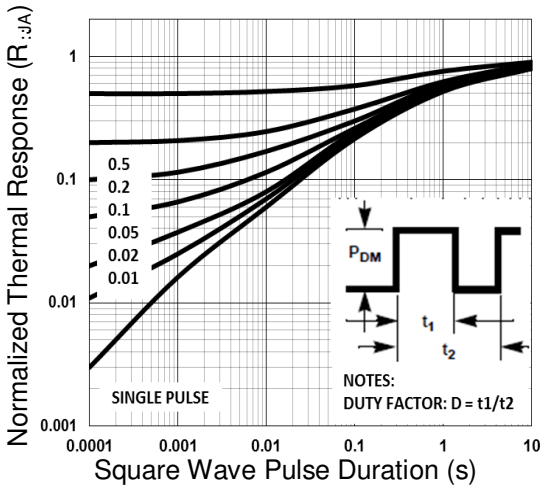
Threshold Voltage vs. Junction Temperature



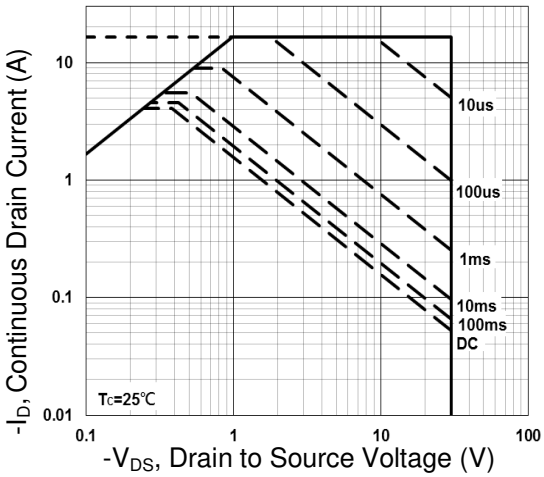
Gate Charge Waveform



Normalized Thermal Transient Impedance Curve



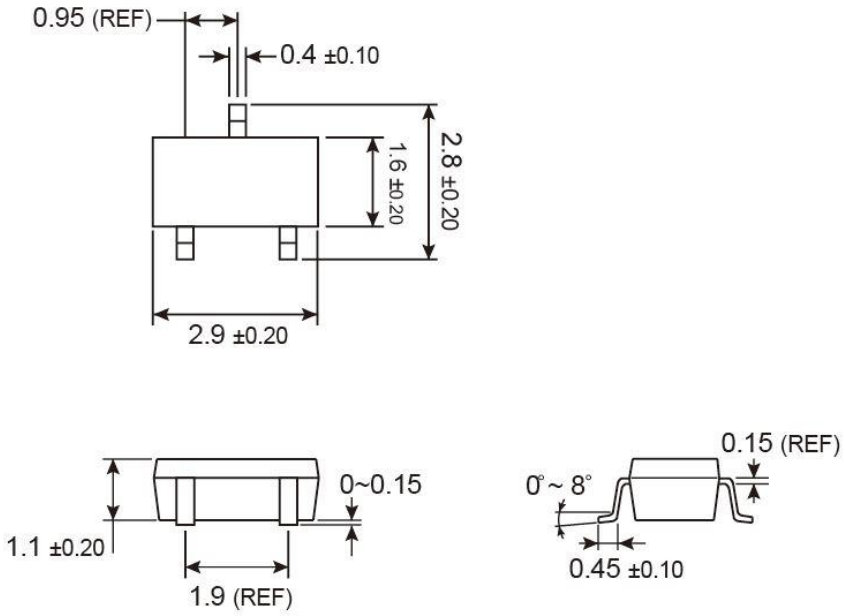
Maximum Safe Operating Area



TSM650P03CX

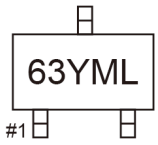
30V P-Channel Power MOSFET

SOT-23 Mechanical Drawing



Unit: Millimeters

Marking Diagram



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

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