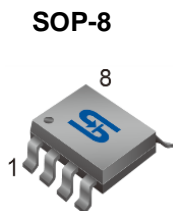


# TSM600P03CS

## 30V P-Channel Power MOSFET



**Pin Definition:**  
 1. Source      8. Drain  
 2. Source      7. Drain  
 3. Source      6. Drain  
 4. Gate        5. Drain

### Key Parameter Performance

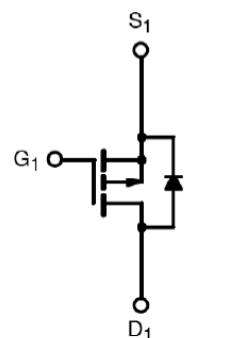
Parameter	Value	Unit
$V_{DS}$	-30	V
$R_{DS(on)}$ (max)	$V_{GS}=-10V$	60
	$V_{GS}=-4.5V$	90
$Q_g$	5.1	nC

### Ordering Information

Part No.	Package	Packing
TSM600P03CS RLG	SOP-8	2.5kps / 13" 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 ( $T_c = 25^\circ C$ 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*	$I_D$	$T_c = 25^\circ C$	-4.7
		$T_c = 100^\circ C$	-3
Pulsed Drain Current <sup>(Note 1)</sup>	$I_{DM}$	-18.8	A
Power Dissipation @ $T_c = 25^\circ C$	$P_D$	2.1	W
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ C$

### Thermal Performance

Parameter	Symbol	Limit	Unit
Thermal Resistance - Junction to Ambient	$R_{\theta JA}$	50	$^\circ C/W$

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

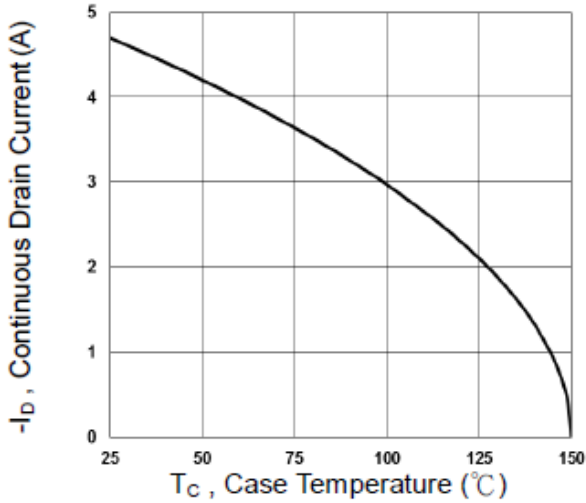
Parameter	Conditions	Symbol	Min	Typ	Max	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA	BV <sub>DSS</sub>	-30	--	--	V
Drain-Source On-State Resistance	V <sub>GS</sub> = -10V, I <sub>D</sub> = -3A	R <sub>DS(ON)</sub>	--	44	60	mΩ
	V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -2A		--	73	90	
Gate Threshold Voltage	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	V <sub>GS(TH)</sub>	-1.2	-1.6	-2.5	V
Zero Gate Voltage Drain Current	V <sub>DS</sub> = -30V, T <sub>J</sub> = 25°C	I <sub>DSS</sub>	--	--	-1	μA
	V <sub>DS</sub> = -24V, T <sub>J</sub> = 125°C		--	--	-10	
Gate Body Leakage	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V	I <sub>GSS</sub>	--	--	±100	nA
Forward Transconductance <sup>(Note 2)</sup>	V <sub>DS</sub> = -10V, I <sub>D</sub> = -3A	g <sub>fs</sub>	--	3.5	--	S
<b>Dynamic</b>						
Total Gate Charge <sup>(Note 2,3)</sup>	V <sub>DS</sub> = -15V, I <sub>D</sub> = -3A, V <sub>GS</sub> = -4.5V	Q <sub>g</sub>	--	5.1	--	nC
Gate-Source Charge <sup>(Note 2,3)</sup>		Q <sub>gs</sub>	--	2	--	
Gate-Drain Charge <sup>(Note 2,3)</sup>		Q <sub>gd</sub>	--	2.2	--	
Input Capacitance	V <sub>DS</sub> = -15V, V <sub>GS</sub> = 0V, f = 1.0MHz	C <sub>iss</sub>	--	560	--	pF
Output Capacitance		C <sub>oss</sub>	--	55	--	
Reverse Transfer Capacitance		C <sub>rss</sub>	--	40	--	
<b>Switching</b>						
Turn-On Delay Time <sup>(Note 2,3)</sup>	V <sub>DD</sub> = -15V, I <sub>D</sub> = -1A, V <sub>GS</sub> = -10V, R <sub>G</sub> = 6Ω	t <sub>d(on)</sub>	--	3.4	--	ns
Turn-On Rise Time <sup>(Note 2,3)</sup>		t <sub>r</sub>	--	10.8	--	
Turn-Off Delay Time <sup>(Note 2,3)</sup>		t <sub>d(off)</sub>	--	26.9	--	
Turn-Off Fall Time <sup>(Note 2,3)</sup>		t <sub>f</sub>	--	6.9	--	
<b>Source-Drain Diode Ratings and Characteristic</b>						
Maximum Continuous Drain-Source Diode Forward Current	Integral reverse diode in the MOSFET	I <sub>S</sub>	--	--	-4.7	A
Maximum Pulse Drain-Source Diode Forward Current		I <sub>SM</sub>	--	--	-18.8	A
Diode-Source Forward Voltage	V <sub>GS</sub> = 0V, I <sub>S</sub> = -1A	V <sub>SD</sub>	--	--	-1	V

**Note:**

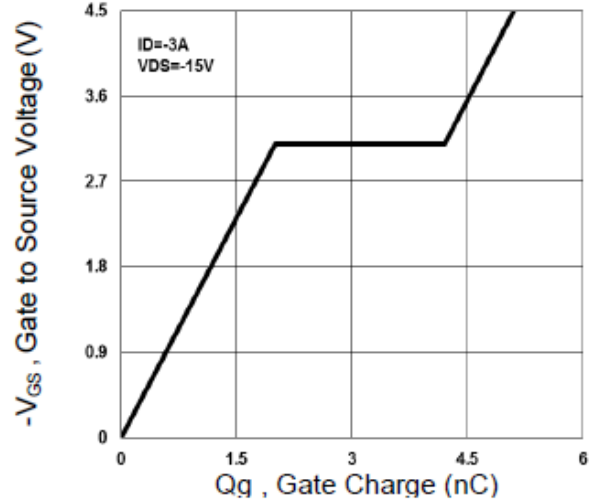
1. Pulse width limited by safe operating area
2. Pulse test: pulse width ≤300μs, duty cycle ≤2%
3. Switching time is essentially independent of operating temperature.

### Electrical Characteristics Curve

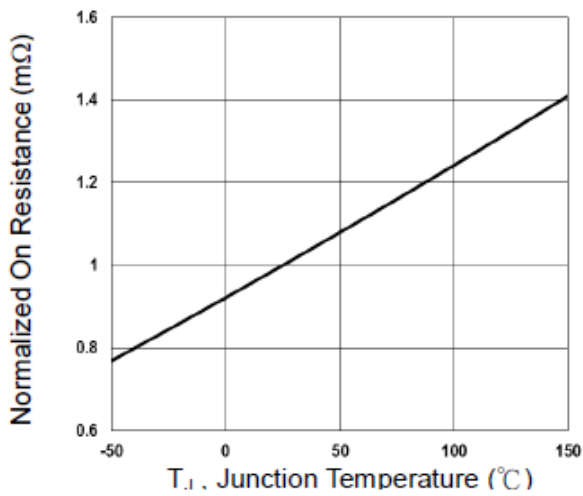
Continuous Drain Current vs.  $T_c$



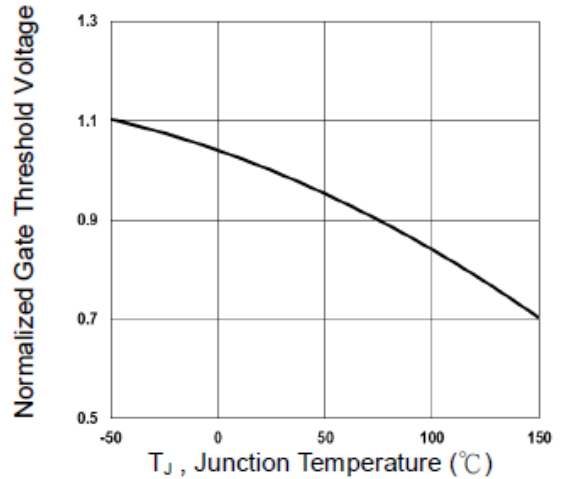
Gate Charge



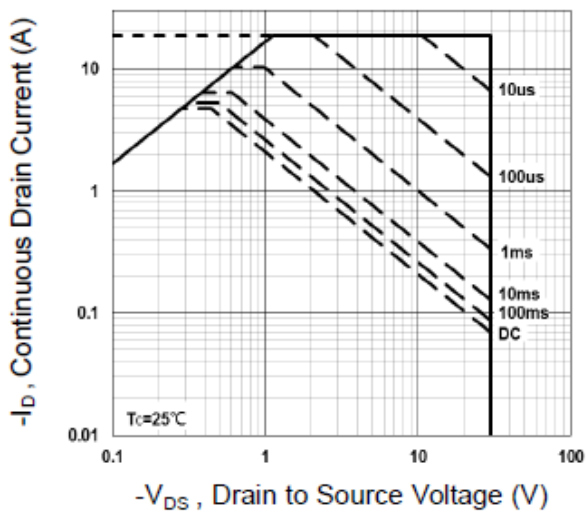
On-Resistance vs. Junction Temperature



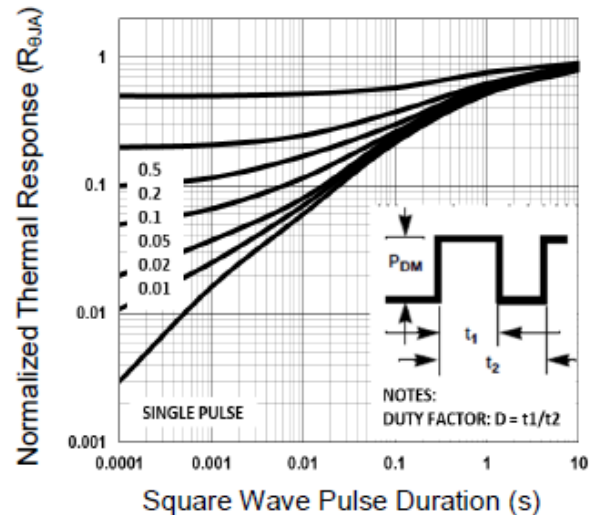
Threshold Voltage vs. Junction Temperature



Maximum Safe Operating Area

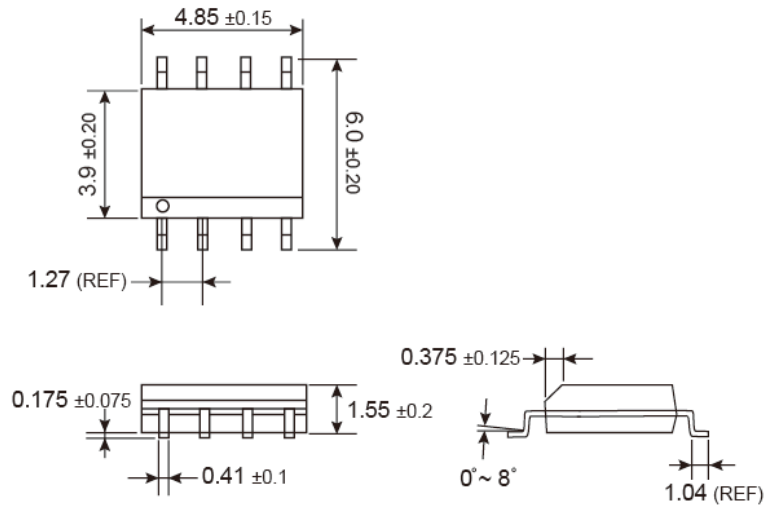


Normalized Thermal Transient Impedance Curve



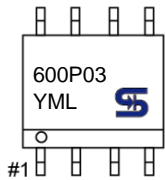


### SOP-8 Mechanical Drawing



Unit: Millimeters

### MARKING DIAGRAM



- 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

# TSM600P03CS

## 30V P-Channel Power MOSFET

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