N-Channel Power MOSFET

800V, 0.3A, 21.6Ω

FEATURES

- Advanced planar process
- 100% avalanche tested
- Fast switching

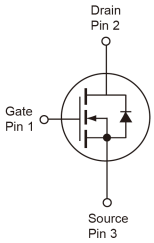
APPLICATION

- Power Supply
- Lighting

KEY PERFORMANCE PARAMETERS		
PARAMETER	**VALUE**	**UNIT**
V_{DS}	800	V
$R_{DS(on)}$ (max)	21.6	Ω
Q_g	5	nC

Pb-Free RoHS COMPLIANT HALOGEN FREE

SOT-223



Notes: Moisture sensitivity level: level 3. Per J-STD-020

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)			
PARAMETER	**SYMBOL**	**LIMIT**	**UNIT**
Drain-Source Voltage	V_{DS}	800	V
Gate-Source Voltage	V_{GS}	±30	V
Continuous Drain Current	I_D	0.3	A
Pulsed Drain Current (Note 1)	I_{DM}	1	A
Single Pulse Avalanche Energy (Note 2)	E_{AS}	90	mJ
Avalanche Current, Repetitive or Not-Repetitive (Note 1)	I_{AR}	1	A
Total Power Dissipation @ T_C = 25°C	P_{DTOT}	2.1	W
Operating Junction Temperature	T_J	150	°C
Operating Junction and Storage Temperature Range	T_J, T_{STG}	- 55 to +150	°C

THERMAL PERFORMANCE			
PARAMETER	**SYMBOL**	**LIMIT**	**UNIT**
Junction to Ambient Thermal Resistance	$R_{\Theta JA}$	60	°C/W

Notes: $R_{\Theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistances. The case thermal reference is defined at the solder mounting surface of the drain pins. $R_{\Theta JA}$ is guaranteed by design while $R_{\Theta CA}$ is determined by the user's board design. $R_{\Theta JA}$ shown below for single device operation on FR-4 PCB in still air

ELECTRICAL SPECIFICATIONS (T_A = 25°C unless otherwise noted)						
PARAMETER	**CONDITIONS**	**SYMBOL**	**MIN**	**TYP**	**MAX**	**UNIT**
Static						
Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 1mA	BV_{DSS}	800	--	--	V
Drain-Source On-State Resistance	V_{GS} = 10V, I_D = 0.15A	$R_{DS(ON)}$	--	18	21.6	Ω
Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	$V_{GS(TH)}$	3	--	5	V
Zero Gate Voltage Drain Current	V_{DS} = 800V, V_{GS} = 0V	I_{DSS}	--	--	25	μA
Gate Body Leakage	V_{GS} = ±30V, V_{DS} = 0V	I_{GSS}	--	--	±10	μA
Forward Transconductance	V_{DS} = 40V, I_D = 0.1A	g_{fs}	--	0.36	--	S
Diode Forward Voltage	I_S = 0.2A, V_{GS} = 0V	V_{SD}	--	--	1.4	V
Dynamic (Note 3)						
Total Gate Charge	V_{DS} = 640V, I_D = 0.3A, V_{GS} = 10V	Q_g	--	5	6	nC
Gate-Source Charge		Q_{gs}	--	1	--	
Gate-Drain Charge		Q_{gd}	--	2	--	
Input Capacitance	V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz	C_{iss}	--	155	200	pF
Output Capacitance		C_{oss}	--	20	26	
Reverse Transfer Capacitance		C_{rss}	--	2.7	4	
Switching (Note 4)						
Turn-On Delay Time	V_{GS} = 10V, I_D = 0.3A, V_{DS} = 400V, R_G = 25Ω	$t_{d(on)}$	--	10	30	ns
Turn-On Rise Time		t_r	--	20	50	
Turn-Off Delay Time		$t_{d(off)}$	--	16	45	
Turn-Off Fall Time		t_f	--	25	60	

Note:

1. Pulse test: pulse width <=300uS, duty cycle <=2%
2. (V_{DD} = 50V, I_{AS}=0.8A, L=170mH, R_G=25Ω)
3. For design reference only, not subject to production testing.
4. Switching time is essentially independent of operating temperature.

ORDERING INFORMATION

PART NO.	PACKAGE	PACKING
TSM1N80CW RPG	SOT-223	2,500pcs / 13” Reel

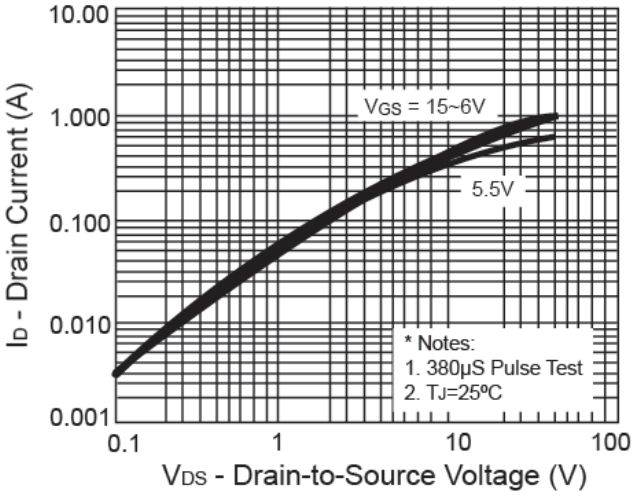
Note:

1. Compliant to RoHS Directive 2011/65/EU and in accordance to WEEE 2002/96/EC
2. Halogen-free according to IEC 61249-2-21 definition

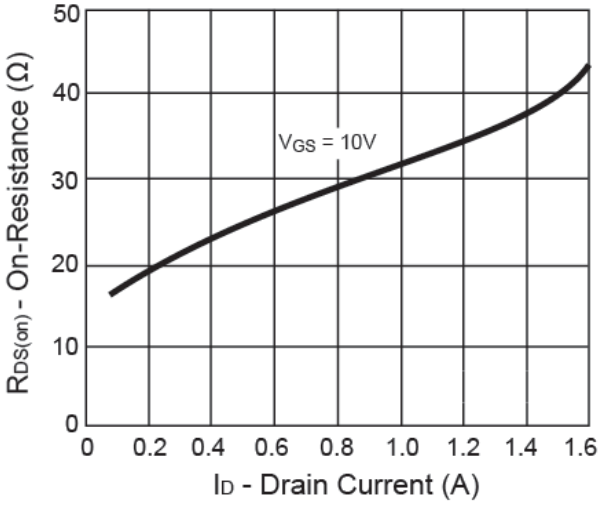
CHARACTERISTICS CURVES

(T_A = 25°C unless otherwise noted)

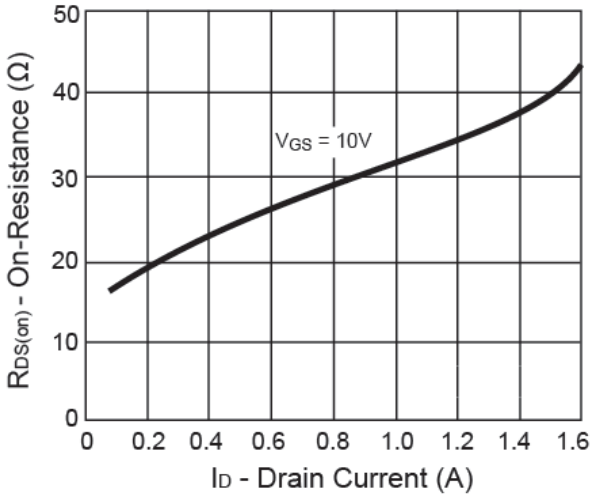
Output Characteristics



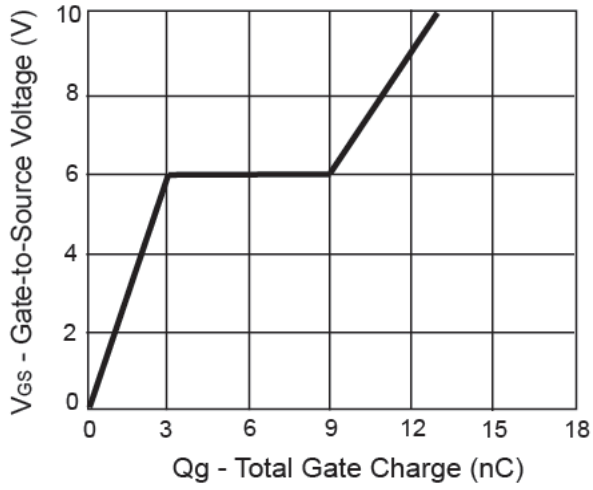
Transfer Characteristics



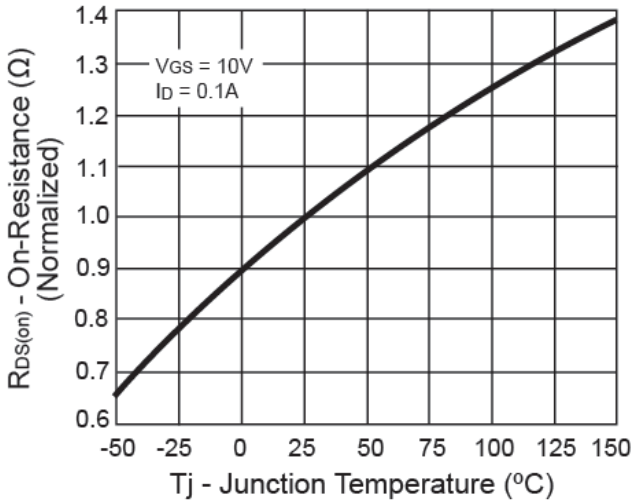
On-Resistance vs. Drain Current



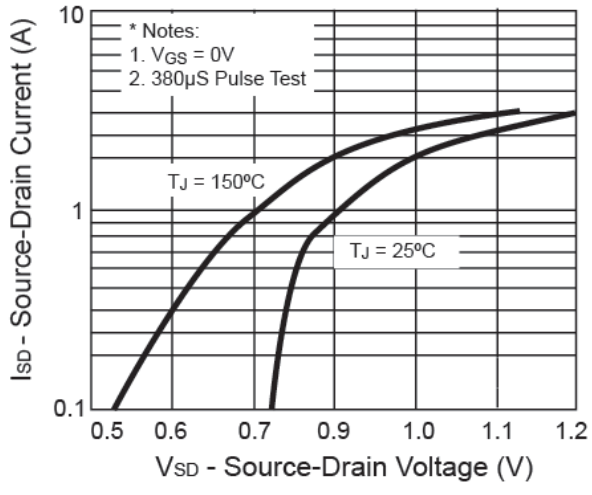
Gate Charge



On-Resistance vs. Junction Temperature



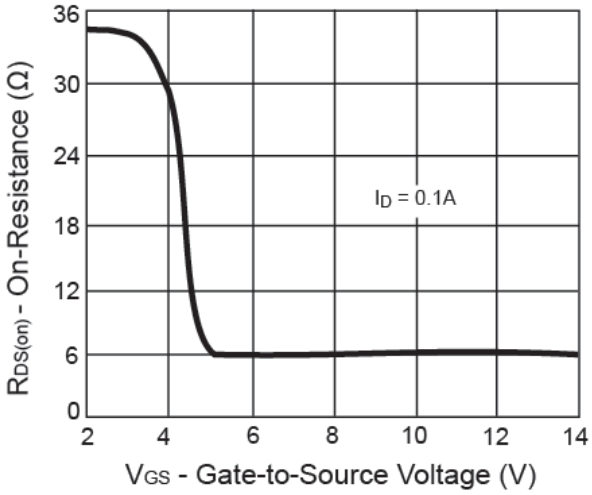
Source-Drain Diode Forward Voltage



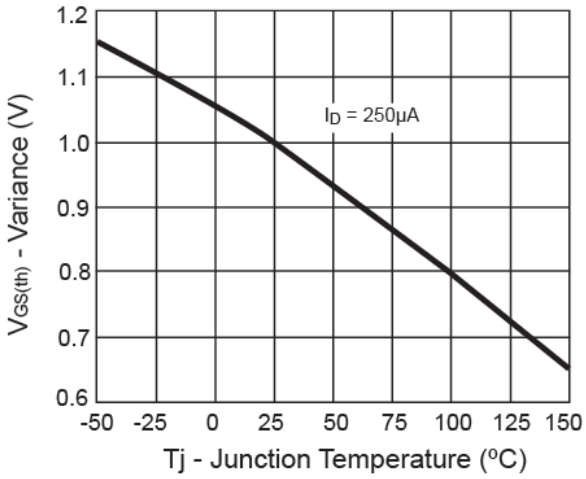
CHARACTERISTICS CURVES

(T_A = 25°C unless otherwise noted)

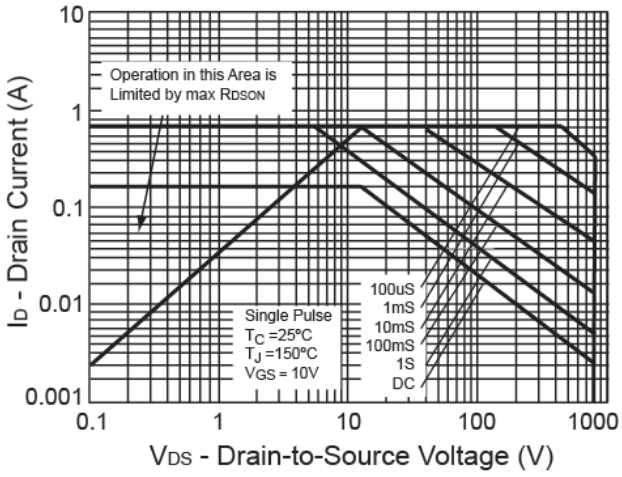
On-Resistance vs. Gate-Source Voltage



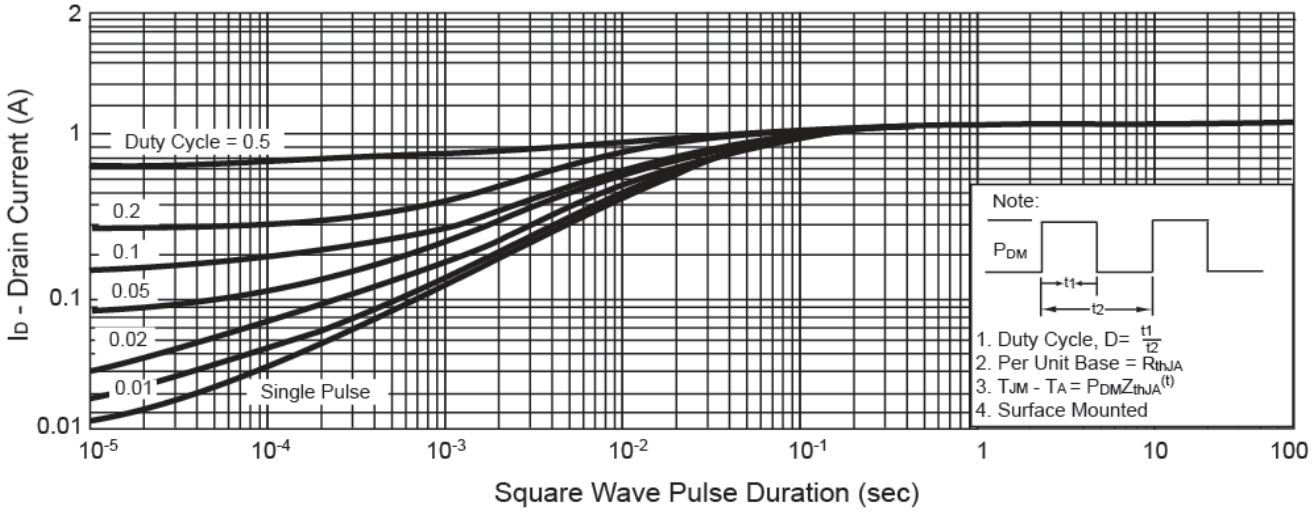
Threshold Voltage



Maximum Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Ambient



PACKAGE OUTLINE DIMENSIONS (Unit: Millimeters)

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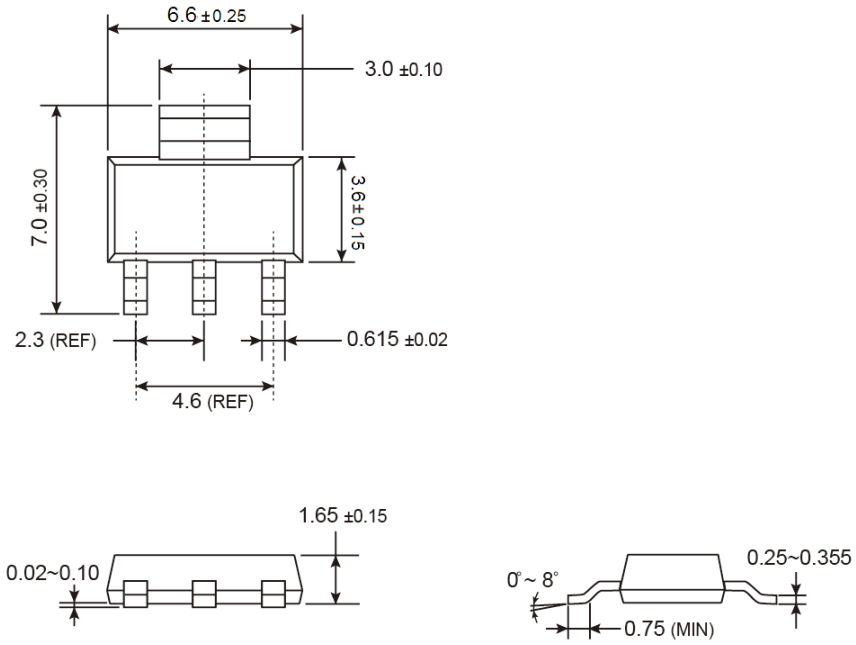
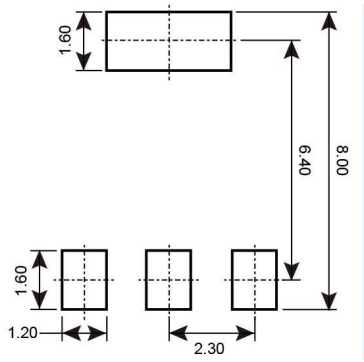
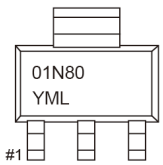


SUGGESTED PAD LAYOUT (Unit: Millimeters)



MARKING DIAGRAM



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 (1~9, A~Z)

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