

N-Channel Power MOSFET

30V, 73A, 8mΩ

FEATURES

- Low $R_{DS(on)}$ to minimize conductive Losses
- Low gate charge for fast power switching
- 100% UIS and R_g tested
- Compliant to RoHS Directive 2011/65/EU and in accordance to WEEE 2002/96/EC
- Halogen-free according to IEC 61249-2-21 definition

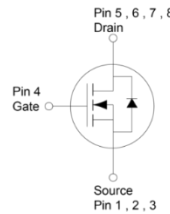
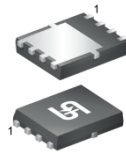
APPLICATIONS

- DC-DC Converters
- Battery Power Management
- ORing FET/Load Switch

PRODUCT SUMMARY			
PARAMETER		VALUE	UNIT
V_{DS}		30	V
$R_{DS(on)}$ (max)	$V_{GS} = 10V$	8	mΩ
	$V_{GS} = 4.5V$	12.5	
Q_g		7.2	nC



PDFN56



Notes: MSL 1 (Moisture Sensitivity Level) per J-STD-020

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted)				
PARAMETER		SYMBOL	LIMIT	UNIT
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current (Note 1)	$T_C = 25^\circ\text{C}$	I_D	73	A
	$T_A = 25^\circ\text{C}$		14	
Pulsed Drain Current (Note 1)		I_{DM}	292	A
Single Pulse Avalanche Current (Note 2)		I_{AS}	23	A
Single Pulse Avalanche Energy (Note 2)		E_{AS}	26	mJ
Total Power Dissipation	$T_C = 25^\circ\text{C}$	P_D	69	W
	$T_C = 125^\circ\text{C}$		14	
Total Power Dissipation	$T_A = 25^\circ\text{C}$	P_D	2.6	W
	$T_A = 125^\circ\text{C}$		0.5	
Operating Junction and Storage Temperature Range		T_J, T_{STG}	- 55 to +150	$^\circ\text{C}$

THERMAL RESISTANCE			
PARAMETER	SYMBOL	LIMIT	UNIT
Thermal Resistance – Junction to Case	$R_{\theta JC}$	1.8	$^\circ\text{C/W}$
Thermal Resistance – Junction to Ambient	$R_{\theta JA}$	48	$^\circ\text{C/W}$

Thermal Performance Note: $R_{\theta JA}$ 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.

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

PARAMETER	CONDITIONS	SYMBOL	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	BV_{DSS}	30	--	--	V
Gate Threshold Voltage	$V_{GS} = V_{DS}, I_D = 250\mu A$	$V_{GS(TH)}$	1	1.6	2.5	V
Gate-Source Leakage Current	$V_{GS} = \pm 20V, V_{DS} = 0V$	I_{GSS}	--	--	± 100	nA
Drain-Source Leakage Current	$V_{GS} = 0V, V_{DS} = 30V$	I_{DSS}	--	--	1	μA
Drain-Source On-State Resistance (Note 3)	$V_{GS} = 10V, I_D = 14A$	$R_{DS(on)}$	--	6.5	8	m Ω
	$V_{GS} = 4.5V, I_D = 14A$		--	9.5	12.5	
Forward Transconductance (Note 3)	$V_{DS} = 5V, I_D = 14A$	g_{fs}	--	30	--	S
Dynamic (Note 4)						
Total Gate Charge	$V_{GS} = 10V, V_{DS} = 15V, I_D = 14A$	Q_g	--	14.4	--	nC
Total Gate Charge	$V_{GS} = 4.5V, V_{DS} = 15V, I_D = 14A$	Q_g		7.2		
Gate-Source Charge		Q_{gs}	--	2.6	--	
Gate-Drain Charge		Q_{gd}	--	3.3	--	
Input Capacitance	$V_{GS} = 0V, V_{DS} = 15V, f = 1.0MHz$	C_{iss}	--	843	--	pF
Output Capacitance		C_{oss}	--	157	--	
Reverse Transfer Capacitance		C_{rss}	--	95	--	
Gate Resistance	$f = 1.0MHz, \text{open drain}$	R_g	0.9	3	6	Ω
Switching (Note 4)						
Turn-On Delay Time	$V_{GS} = 10V, V_{DS} = 15V, I_D = 14A, R_G = 3.3\Omega$	$t_{d(on)}$	--	4.8	--	ns
Rise Time		t_r	--	12.5	--	
Turn-Off Delay Time		$t_{d(off)}$	--	27.6	--	
Fall Time		t_f	--	8.2	--	
Source-Drain Diode						
Diode Forward Voltage (Note 3)	$V_{GS} = 0V, I_S = 15A$	V_{SD}	--	--	1	V
Reverse Recovery Time	$I_S = 14A,$	t_{rr}	--	16	--	ns
Reverse Recovery Charge	$di/dt = 100A/\mu s$	Q_{rr}	--	8.3	--	nC

Notes:

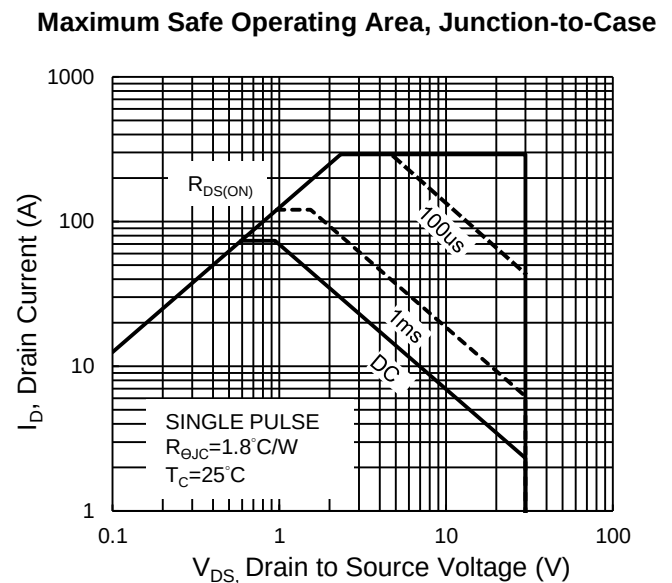
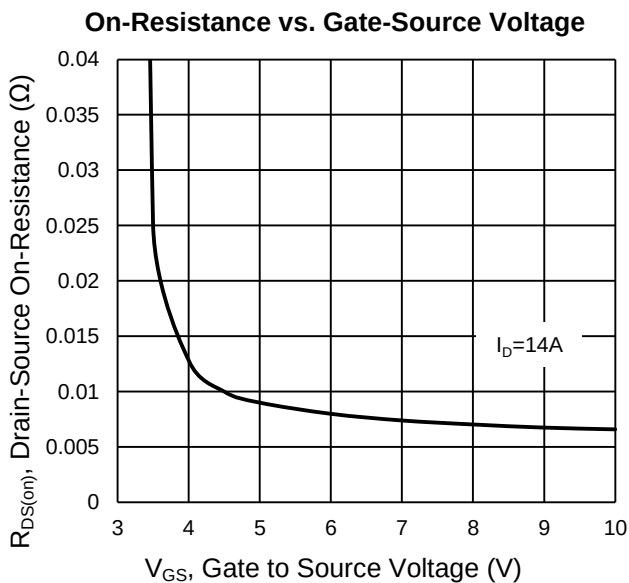
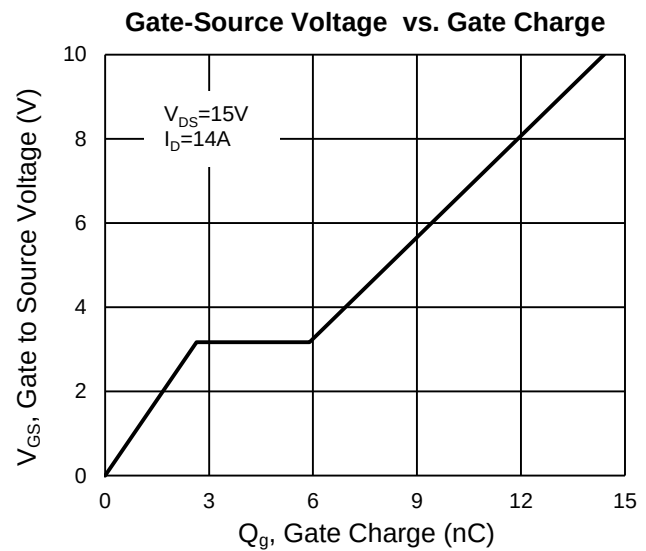
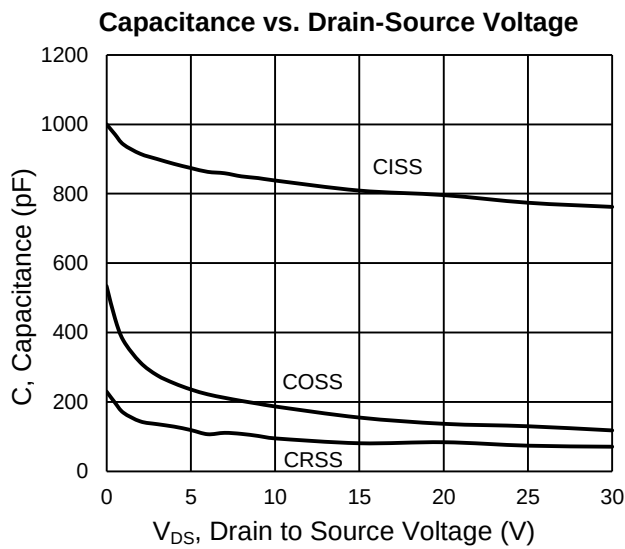
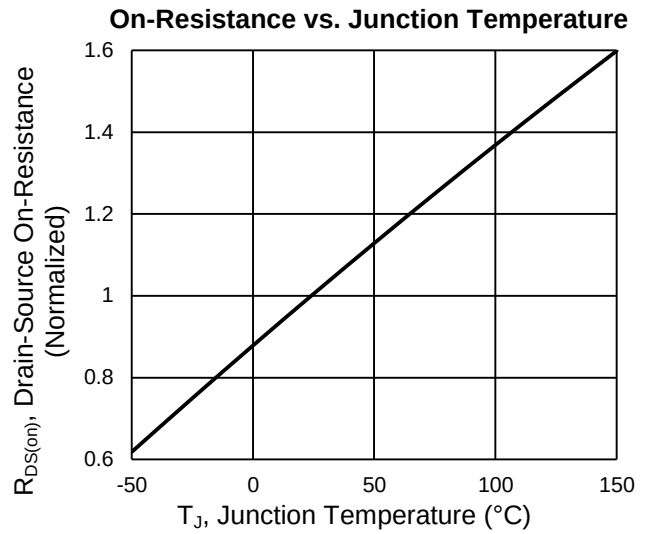
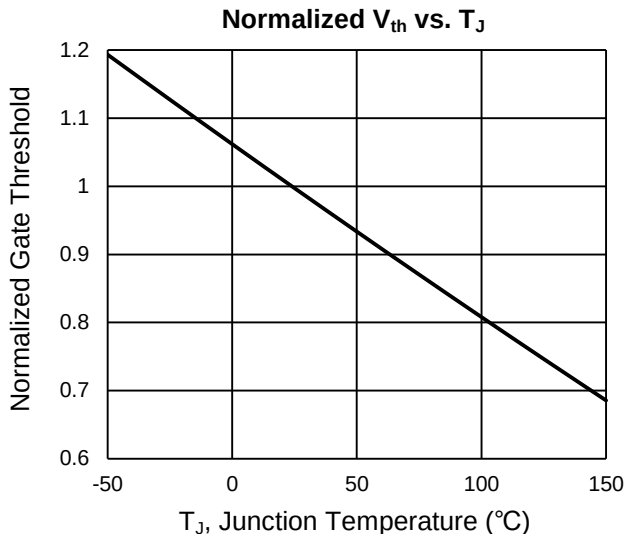
- Current limited by package.
- $L = 0.1mH, V_{GS} = 10V, V_{DS} = 25V, R_G = 25\Omega, I_{AS} = 23A$, Starting $T_J = 25^\circ\text{C}$
- Pulse test: Pulse Width $\leq 300\mu s$, duty cycle $\leq 2\%$.
- Switching time is essentially independent of operating temperature.

ORDERING INFORMATION

PART NO.	PACKAGE	PACKING
TSM080N03PQ56 RLG	PDFN56	2,500pcs / 13" Reel

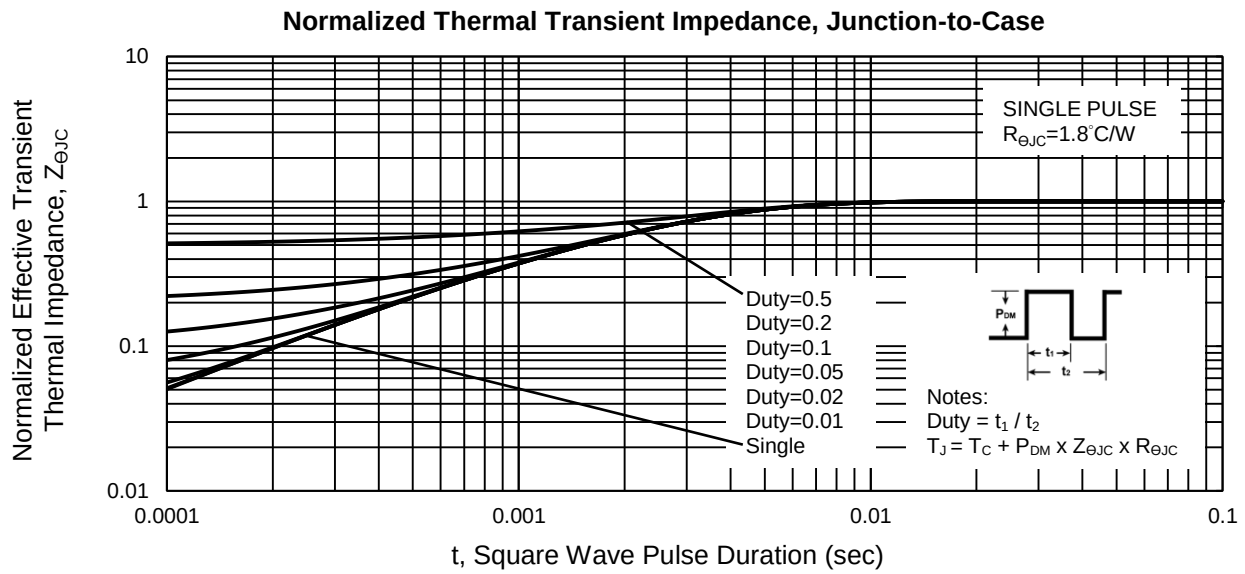
CHARACTERISTICS CURVES

($T_A = 25^\circ\text{C}$ unless otherwise noted)



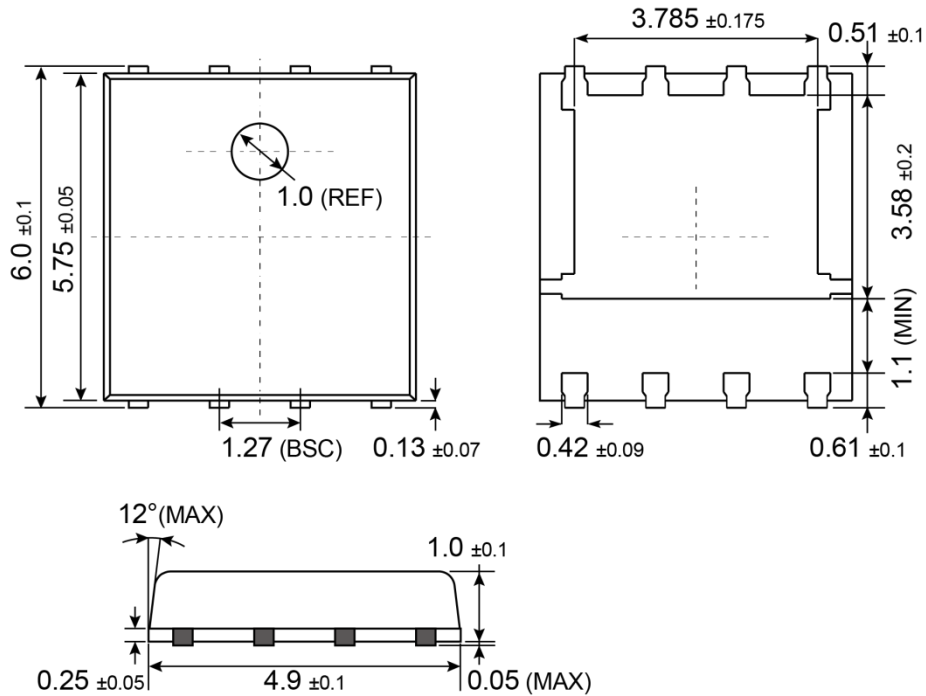
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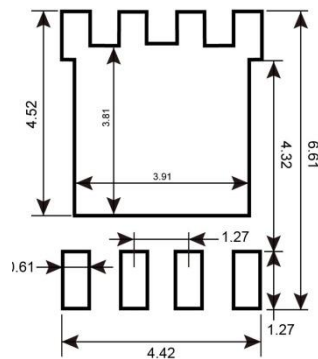


PACKAGE OUTLINE DIMENSIONS (Unit: Millimeters)

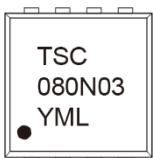
PDFN56



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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