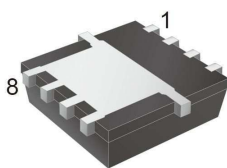


PDFN56



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}	65	V
$R_{DS(on)(max)}$	7	m Ω
Q_g	125	nC

Features

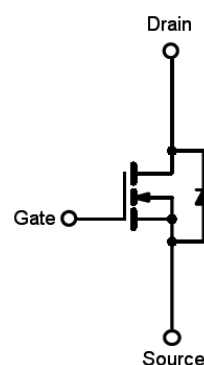
- Low On-Resistance
- Low Input Capacitance
- Low Gate Charge

Ordering Information

Part No.	Package	Packing
TSM070N07PQ56 RLG	PDFN56	2.5kpcs / 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



N-Channel MOSFET

Absolute Maximum Ratings (T_c=25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	65	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current ^(Note 3)	$T_C=25^\circ\text{C}$	75	A
	$T_A=25^\circ\text{C}$	14	
Drain Current-Pulsed ^(Note 1)	I_{DM}	210	A
Single Pulse Avalanche Energy' L=0.5mH	E_{AS}	200	mJ
Maximum Power Dissipation ^(Note 2)	$T_C=25^\circ\text{C}$	59.5	W
	$T_A=25^\circ\text{C}$	2	
Storage Temperature Range	T_{STG}	-55 to +150	°C
Operating Junction Temperature Range	T_J	-55 to +150	°C

Thermal Performance

Parameter	Symbol	Limit	Unit
Thermal Resistance - Junction to Case	$R_{\theta JC}$	2.25	°C/W
Thermal Resistance - Junction to Ambient	$R_{\theta JA}$	62	°C/W

Electrical Specifications ($T_J=25^{\circ}\text{C}$ unless otherwise noted)

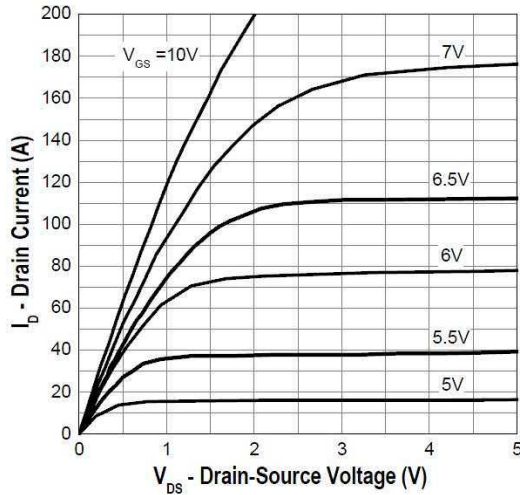
Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$	BV_{DSS}	65	--	--	V
Drain-Source On-State Resistance	$V_{GS} = 10\text{V}, I_D = 30\text{A}$	$R_{DS(ON)}$	--	5.5	7	m Ω
Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	$V_{GS(TH)}$	2	3	4	V
Zero Gate Voltage Drain Current	$V_{DS} = 48\text{V}, V_{GS} = 0\text{V}$	I_{DSS}	--	--	1	μA
Gate Body Leakage	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$	I_{GSS}	--	--	± 100	nA
Dynamic						
Total Gate Charge	$V_{DS} = 30\text{V}, I_D = 30\text{A},$ $V_{GS} = 10\text{V}$	Q_g	--	125	--	nC
Gate-Source Charge		Q_{gs}	--	35	--	
Gate-Drain Charge		Q_{gd}	--	48	--	
Input Capacitance	$V_{DS} = 30\text{V}, V_{GS} = 0\text{V},$ $f = 1.0\text{MHz}$	C_{iss}	--	4780	--	pF
Output Capacitance		C_{oss}	--	645	--	
Reverse Transfer Capacitance		C_{rss}	--	335	--	
Switching						
Turn-On Delay Time	$V_{GS} = 10\text{V}, V_{DS} = 30\text{V},$ $R_G = 3.3\Omega, I_D = 30\text{A}$	$t_{d(on)}$	--	24	--	ns
Turn-On Rise Time		t_r	--	21	--	
Turn-Off Delay Time		$t_{d(off)}$	--	85	--	
Turn-Off Fall Time		t_f	--	42	--	
Drain-Source Diode Characteristics and Maximum Rating						
Drain-Source Diode Forward Voltage	$V_{GS}=0\text{V}, I_S=30\text{A}$	V_{SD}	--	--	1.3	V
Reverse Recovery Time	$I_S = 30\text{A}, di/dt = 100\text{A}/\mu\text{s}$	t_{rr}	--	32	--	ns
Reverse Recovery Charge		Q_{rr}	--	47	--	nC

Notes:

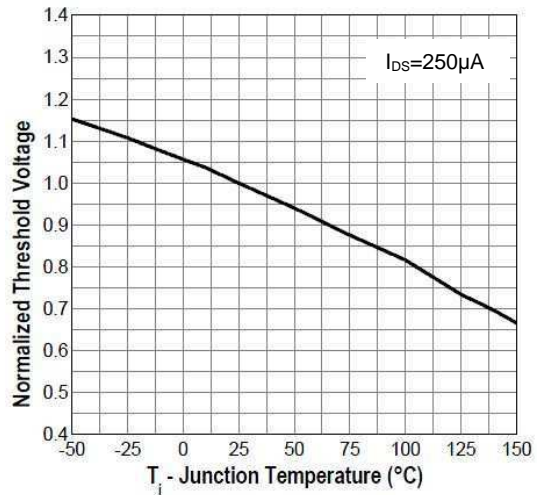
- Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.
- $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistances. The case thermal reference is defined at the solder mounting surface of the drain pins. $R_{\theta JA}$ is guaranteed by design while $R_{\theta CA}$ is determined by the user's board design. $R_{\theta JA}$ shown below for single device operation on FR-4 PCB in still air.
- The maximum current rating is limited by package.

Electrical Characteristics Curves

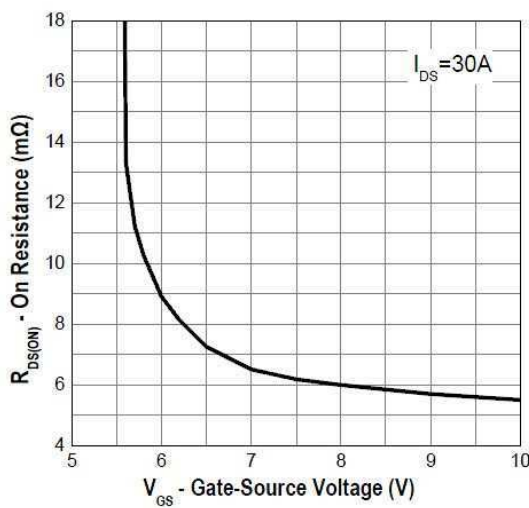
Output Characteristics



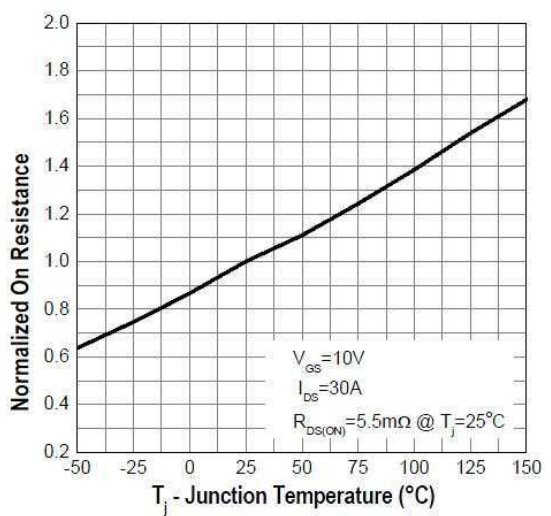
Gate Threshold Voltage



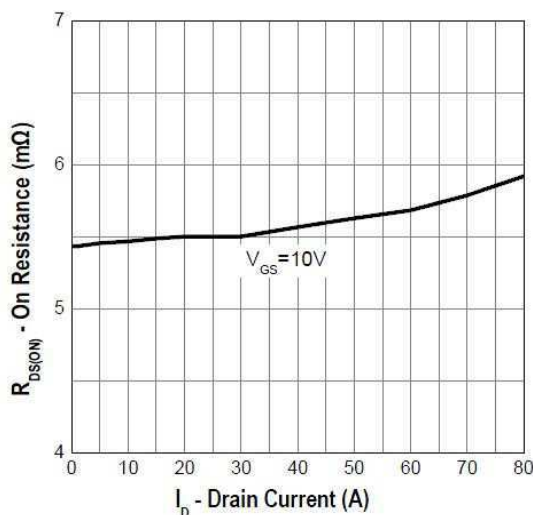
Gate Source On Resistance



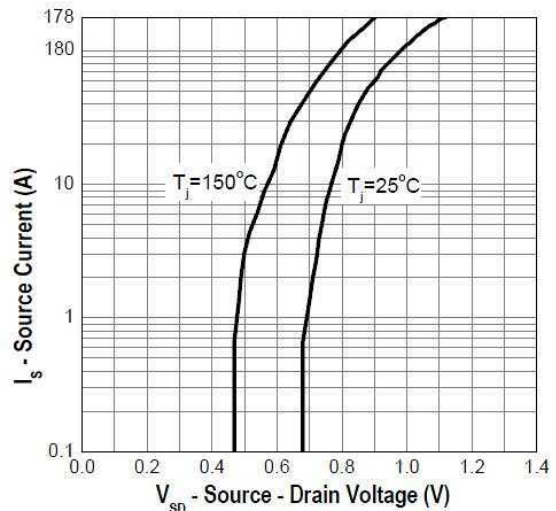
Drain-Source On Resistance



Drain-Source On-Resistance

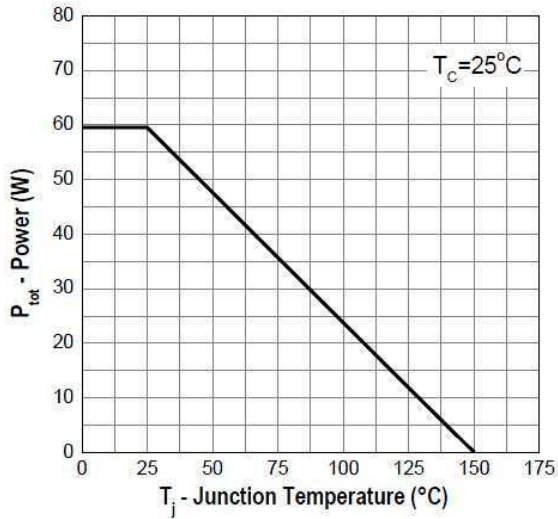


Source-Drain Diode Forward Voltage

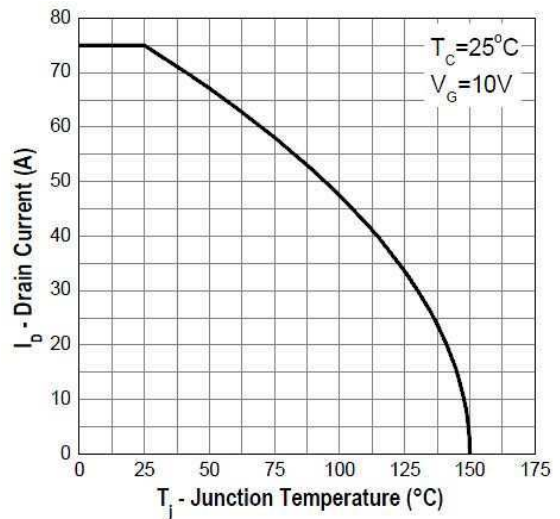


Electrical Characteristics Curves

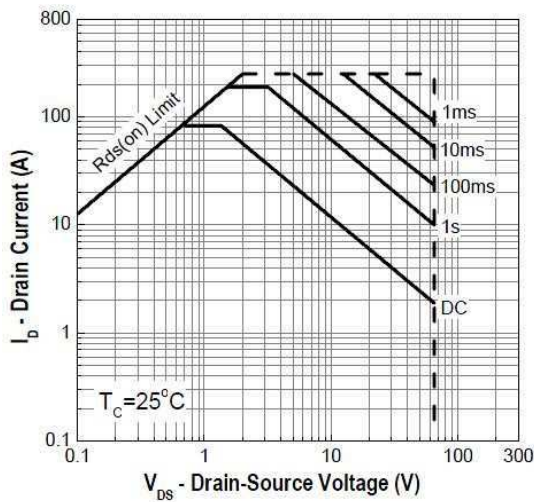
Power Derating



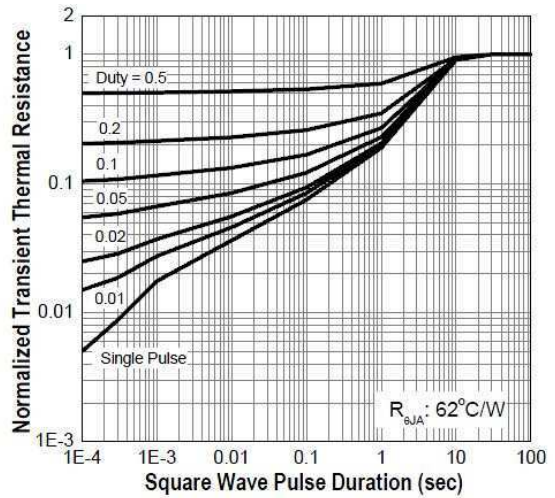
Drain Current vs. Junction Temperature



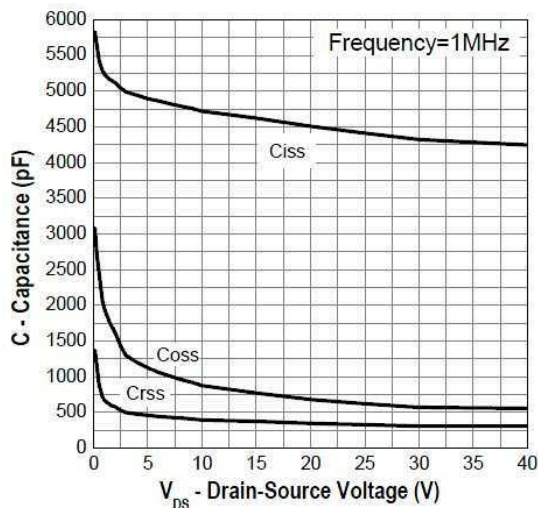
Safe Operation Area



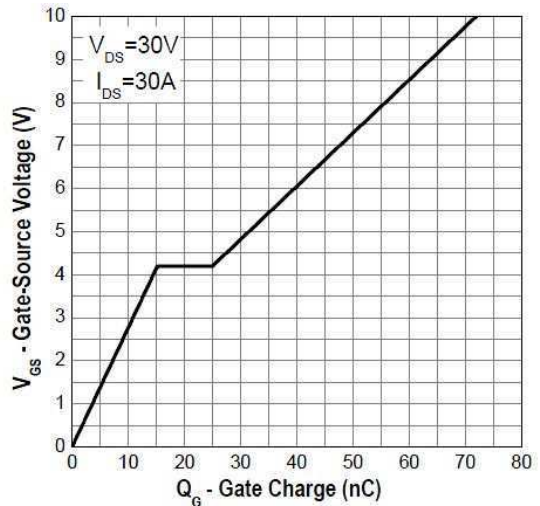
Transient Thermal Impedance



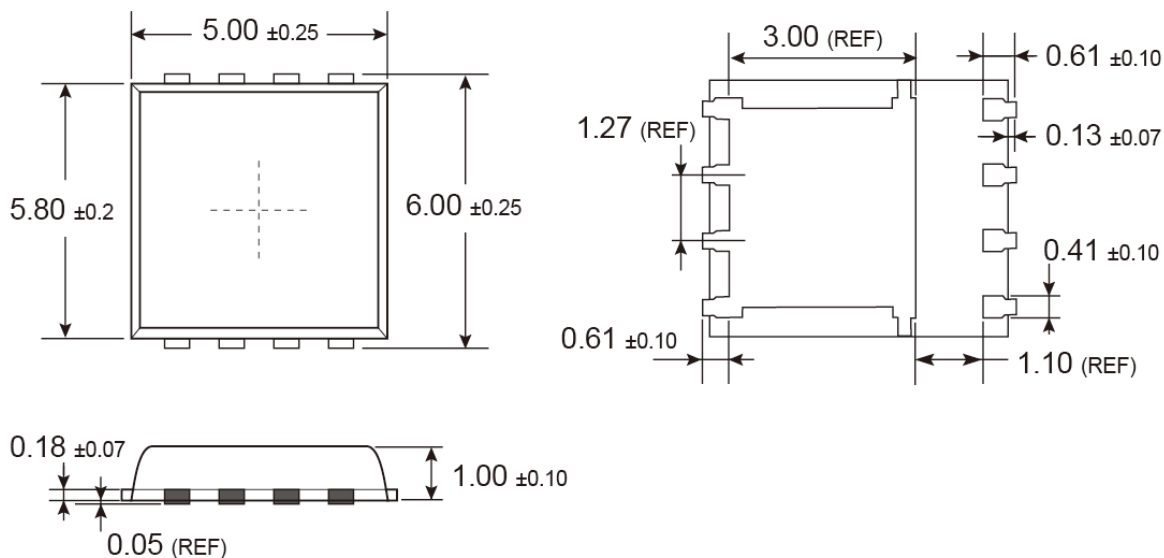
Capacitance



Gate Charge

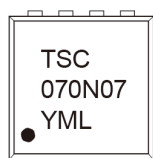


PDFN56 Mechanical Drawing



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

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