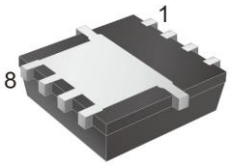
TSM055N03PQ56

30V N-Channel MOSFET

PDFN56



Pin Definition:

1. Source 8. Drain
2. Source 7. Drain
3. Source 6. Drain
4. Gate 5. Drain

Note:

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

Key Parameter Performance

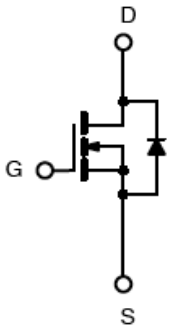
Parameter		Value	Unit
V_{DS}		30	V
$R_{DS(on)}$ (max)	V_{GS} = 10V	5.5	mΩ
	V_{GS} = 4.5V	8.5	
Q_g		11.1	nC

Ordering Information

Part No.	Package	Packing
TSM055N03PQ56 RLG	PDFN56	2.5kpcs / 13” Reel

Note: Halogen-free according to IEC 61249-2-21 definition

Block Diagram



N-Channel MOSFET

Absolute Maximum Ratings (Tc=25℃ unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_C=25℃	I_D	80	A
	T_C=100℃		51	
Drain Current-Pulsed (Note 1)		I_{DM}	320	A
Single Pulse Avalanche Energy (Note 2)		E_{AS}	88	mJ
Maximum Power Dissipation @ T_C = 25℃		P_D	74	W
Storage Temperature Range		T_{STG}	-55 to +150	℃
Operating Junction Temperature Range		T_J	-55 to +150	℃

Thermal Performance

Parameter	Symbol	Limit	Unit
Thermal Resistance - Junction to Case	$R_{\Theta JC}$	1.7	℃/W
Thermal Resistance - Junction to Ambient	$R_{\Theta JA}$	62	℃/W

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30V N-Channel MOSFET

Electrical Specifications (T_C = 25℃ 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 = 20A	$R_{DS(ON)}$	--	4.5	5.5	mΩ
	V_{GS} = 4.5V, I_D = 10A			6.3	8.5	
Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	$V_{GS(TH)}$	1.2	1.6	2.5	V
Zero Gate Voltage Drain Current	V_{DS} = 30V, V_{GS} = 0V	I_{DSS}	--	--	1	μA
	V_{DS} = 24V, V_{GS} = 0V, T_J = 125℃		--	--	10	μA
Gate Body Leakage	V_{GS} = ±20V, V_{DS} = 0V	I_{GSS}	--	--	±100	nA
Dynamic						
Total Gate Charge (Note 3,4)	V_{DS} = 15V, I_D = 20A, V_{GS} = 4.5V	Q_g	--	11.1	--	nC
Gate-Source Charge (Note 3,4)		Q_{gs}	--	1.85	--	
Gate-Drain Charge (Note 3,4)		Q_{gd}	--	6.8	--	
Input Capacitance	V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz	C_{iss}	--	1160	--	pF
Output Capacitance		C_{oss}	--	200	--	
Reverse Transfer Capacitance		C_{rss}	--	180	--	
Switching						
Turn-On Delay Time (Note 3,4)	V_{GS} = 10V, V_{DS} = 15V, R_G = 3.3Ω, I_D = 15A	$t_{d(on)}$	--	7.5	--	ns
Turn-On Rise Time (Note 3,4)		t_r	--	14.5	--	
Turn-Off Delay Time (Note 3,4)		$t_{d(off)}$	--	35.2	--	
Turn-Off Fall Time (Note 3,4)		t_f	--	9.6	--	
Drain-Source Diode Characteristics and Maximum Rating						
Maximum Continuous Drain-Source Diode Forward Current	Integral reverse diode in the MOSFET	I_S	--	--	80	A
Maximum Pulse Drain-Source Diode Forward Current		I_{SM}	--	--	320	A
Drain-Source Diode Forward Voltage	V_{GS} = 0V, I_S = 1A	V_{SD}	--	--	1	V

Notes:

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD} = 25V, V_{GS} = 10V, L = 0.1mH, I_{AS} = 42A, R_G = 25Ω, Starting T_J = 25℃.
3. Pulse test: pulse width ≤ 300μs, duty cycle ≤ 2%
4. Essentially independent of operating temperature.

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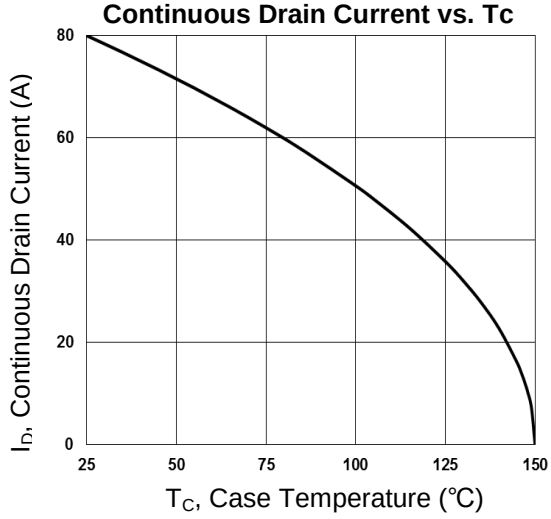
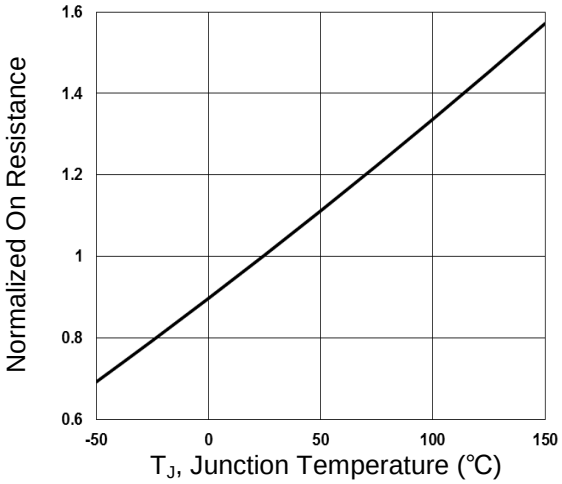
Electrical Characteristics Curves

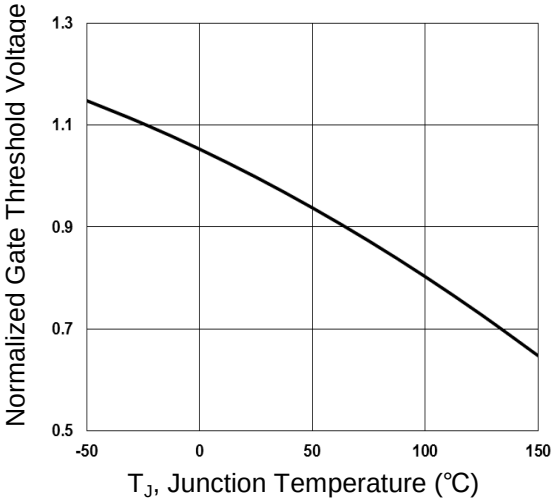
Continuous Drain Current vs. Tc



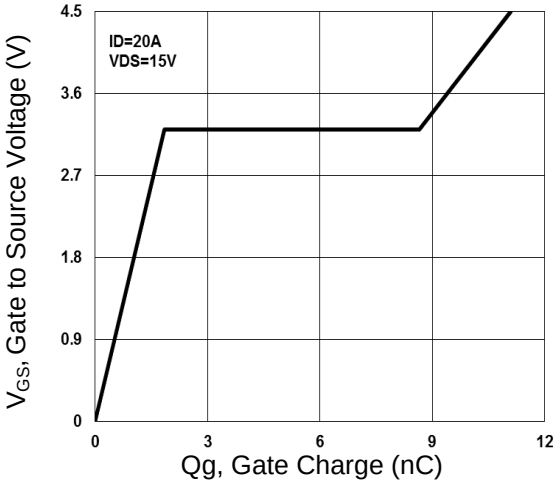
Normalized $R_{DS(on)}$ vs. T_J



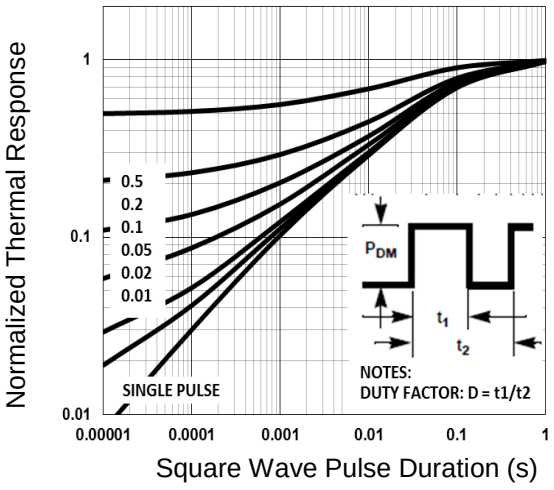
Normalized V_{th} vs. T_J



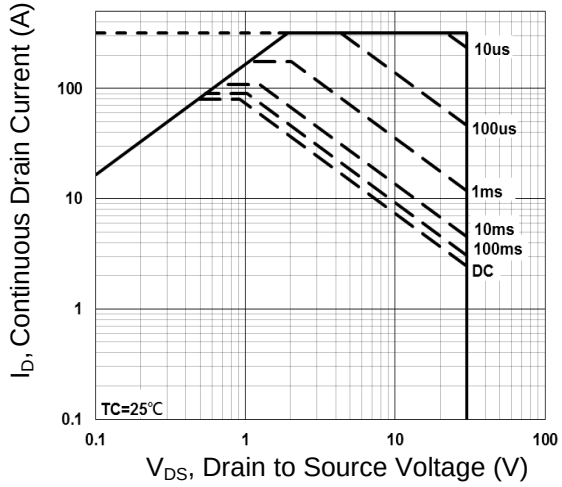
Gate Charge Waveform



Normalized Transient Impedance



Maximum Safe Operation Area



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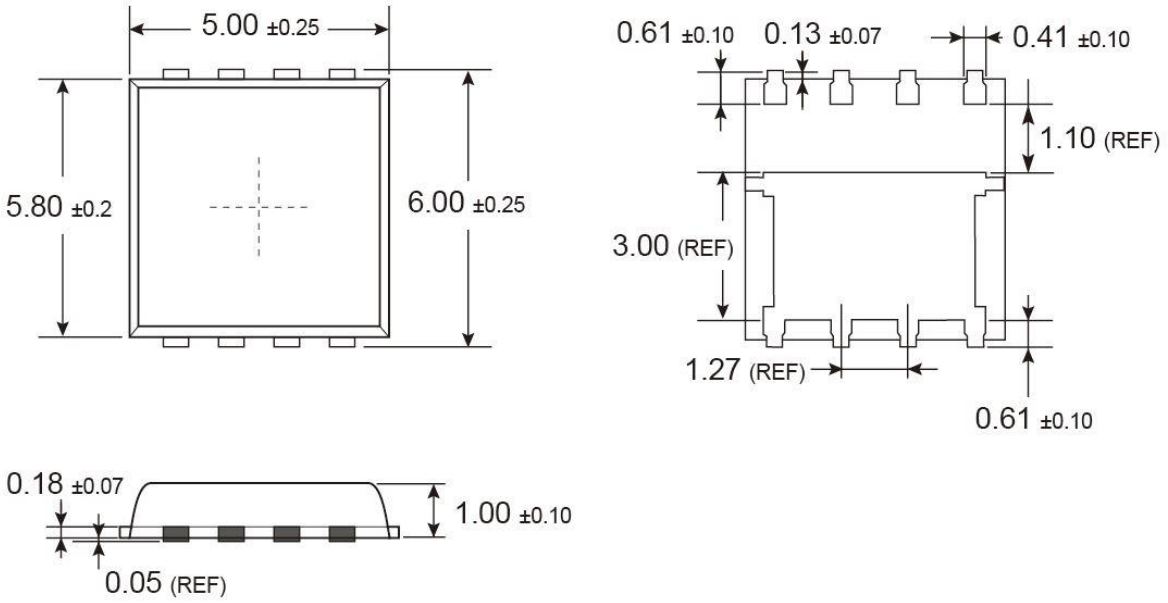
PDFN56 Mechanical Drawing



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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