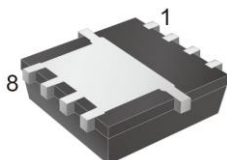


TSM055N03PQ56

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

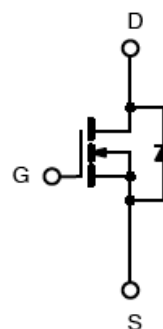
Parameter	Value	Unit
V_{DS}	30	V
$R_{DS(on)}$ (max)	$V_{GS} = 10V$	5.5
	$V_{GS} = 4.5V$	8.5
Q_g	11.1	nC

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

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

Thermal Performance

Parameter	Symbol	Limit	Unit
Thermal Resistance - Junction to Case	$R_{\theta JC}$	1.7	$^\circ\text{C/W}$
Thermal Resistance - Junction to Ambient	$R_{\theta JA}$	62	$^\circ\text{C/W}$

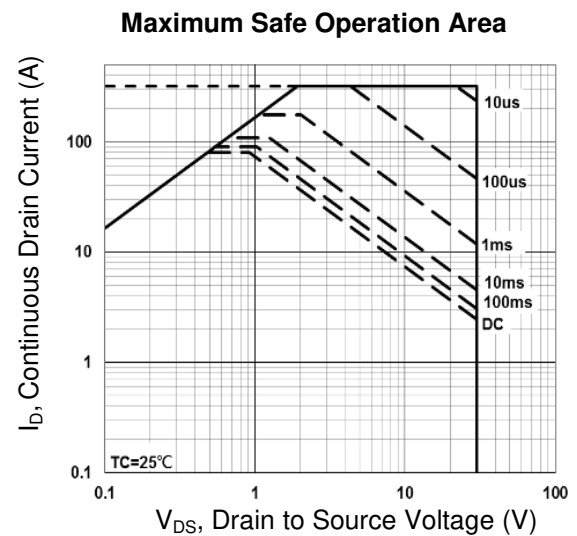
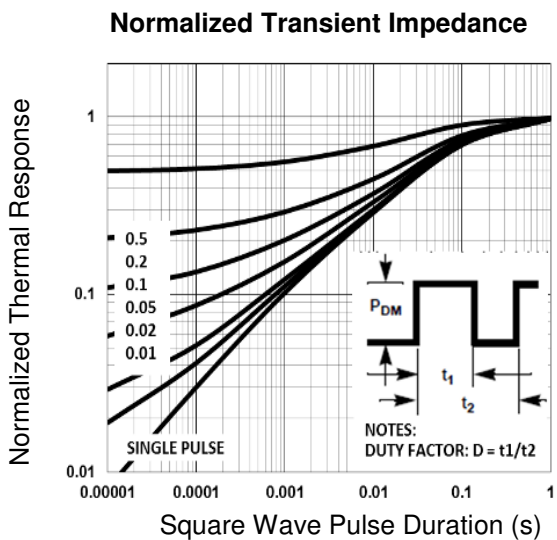
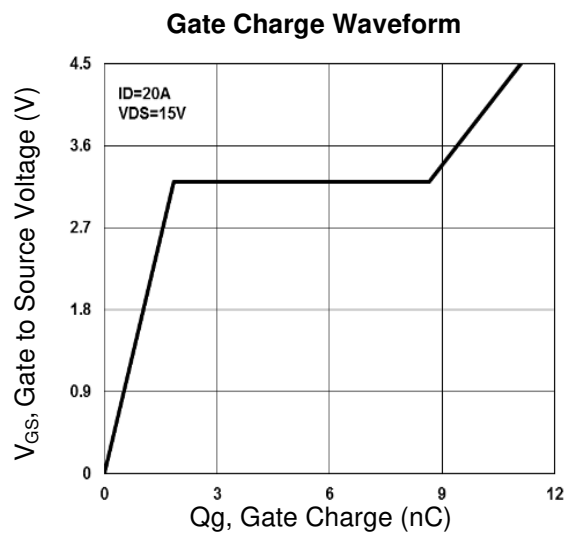
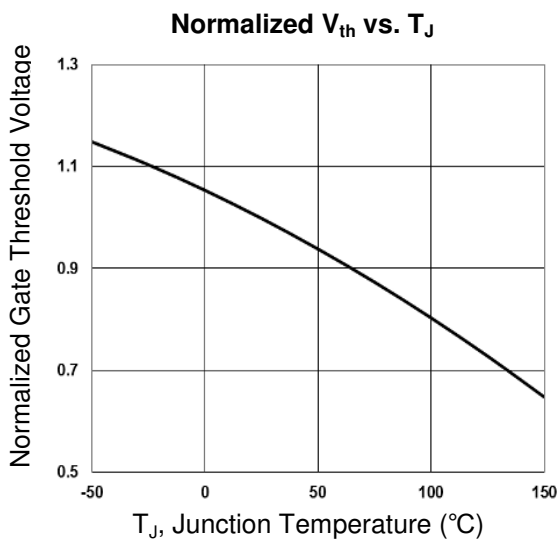
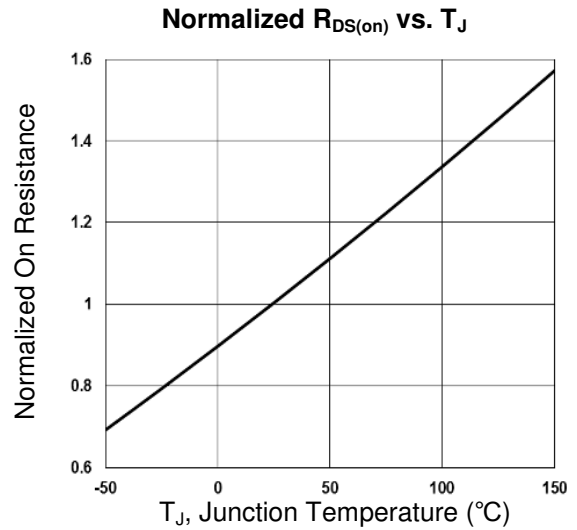
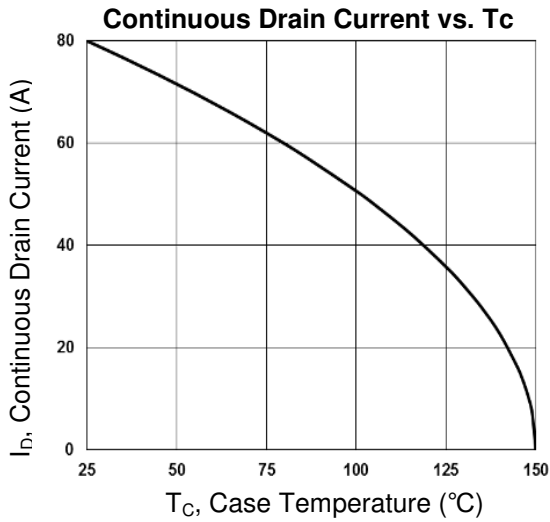
Electrical Specifications (T_C = 25°C unless otherwise noted)

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°C		--	--	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

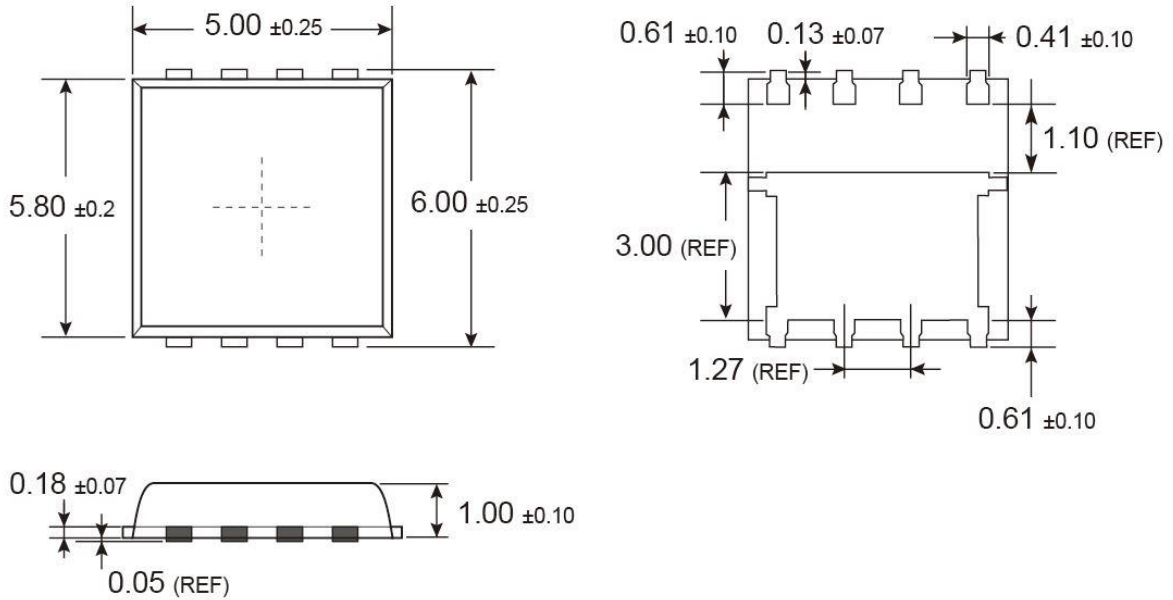
Notes:

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°C.
3. Pulse test: pulse width ≤ 300μs, duty cycle ≤ 2%
4. Essentially independent of operating temperature.

Electrical Characteristics Curves



PDFN56 Mechanical Drawing



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

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