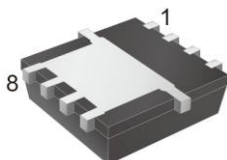


TSM055N03EPQ56

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

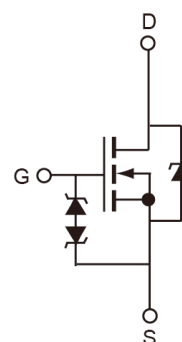
Parameter	Value	Unit
V_{DS}	30	V
$R_{DS(on)}$ (max)	$V_{GS} = 10V$	5.5
	$V_{GS} = 4.5V$	8.5
Q_g	11.1	nC

Ordering Information

Part No.	Package	Packing
TSM055N03EPQ56 RLG	PDFN56	2.5kpcs / 13" Reel

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

Block Diagram



N-Channel MOSFET with ESD protection

Absolute Maximum Ratings (T_c = 25°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	80	A
		51	
Drain Current-Pulsed ^(Note 1)	I_{DM}	320	A
Single Pulse Avalanche Energy ^(Note 2)	E_{AS}	45	mJ
Maximum Power Dissipation @ T _c = 25°C	P_D	74	W
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	$R_{\theta JC}$	1.7	°C/W
Thermal Resistance - Junction to Ambient	$R_{\theta JA}$	62	°C/W

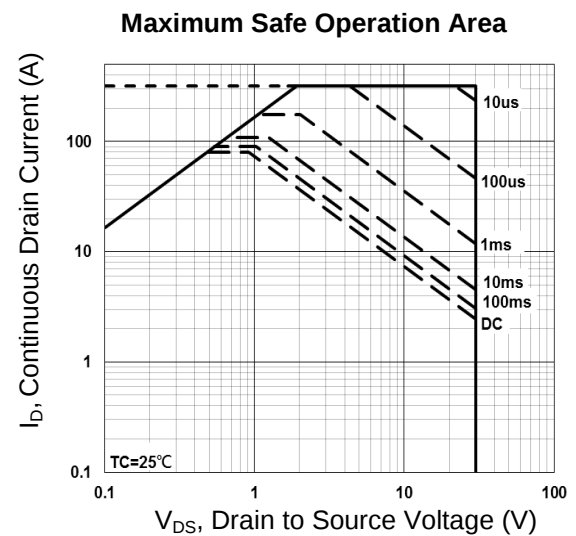
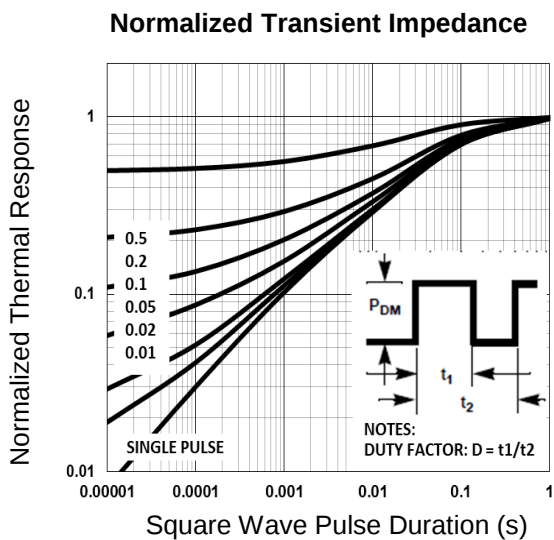
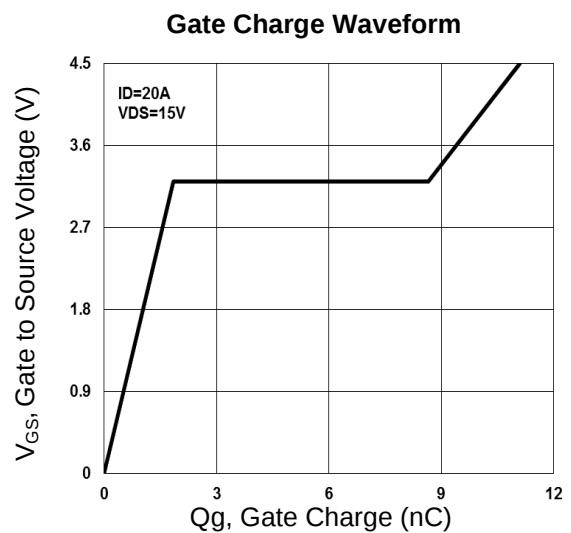
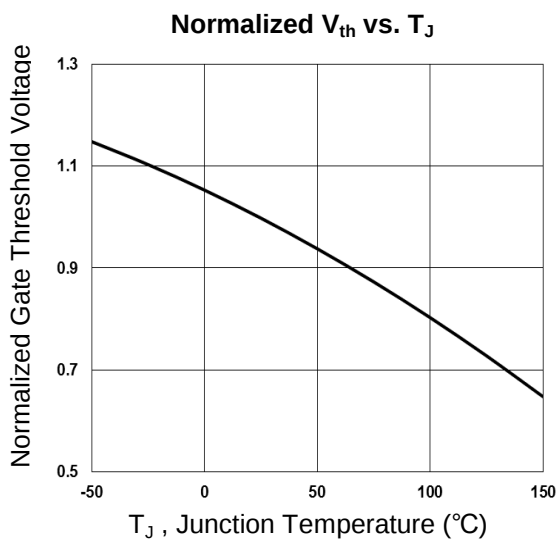
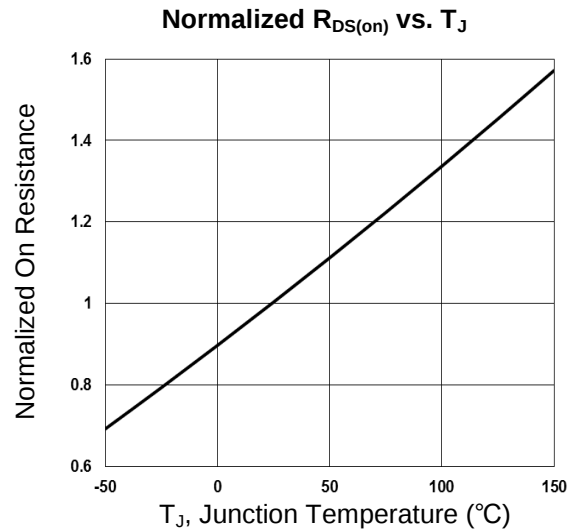
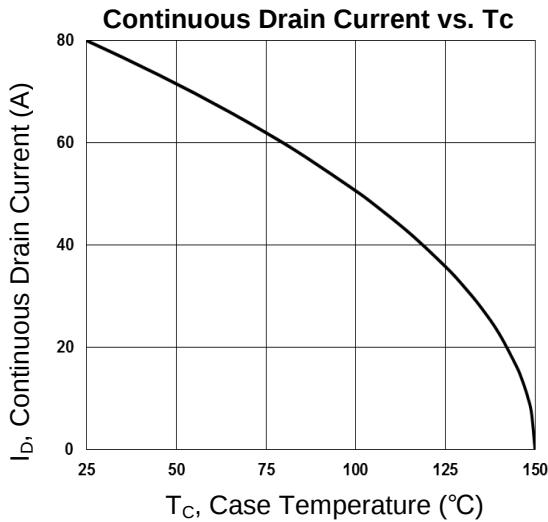
Electrical Specifications ($T_C = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	BV_{DSS}	30	--	--	V
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	$V_{DS} = V_{GS}, I_D = 250\mu A$	$V_{GS(TH)}$	1.2	1.6	2.5	V
Zero Gate Voltage Drain Current	$V_{DS} = 30V, V_{GS} = 0V$	I_{DSS}	--	--	1	μA
	$V_{DS} = 24V, V_{GS} = 0V, T_J = 125^{\circ}C$		--	--	10	μA
Gate Body Leakage	$V_{GS} = \pm 20V, V_{DS} = 0V$	I_{GSS}	--	--	±10	μA
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}	--	1210	--	pF
Output Capacitance		C_{oss}	--	190	--	
Reverse Transfer Capacitance		C_{rss}	--	100	--	
Switching						
Turn-On Delay Time ^(Note 3,4)	$V_{GS} = 10V, V_{DS} = 15V, R_G = 3.3\Omega, I_D = 15A$	$t_{d(on)}$	--	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

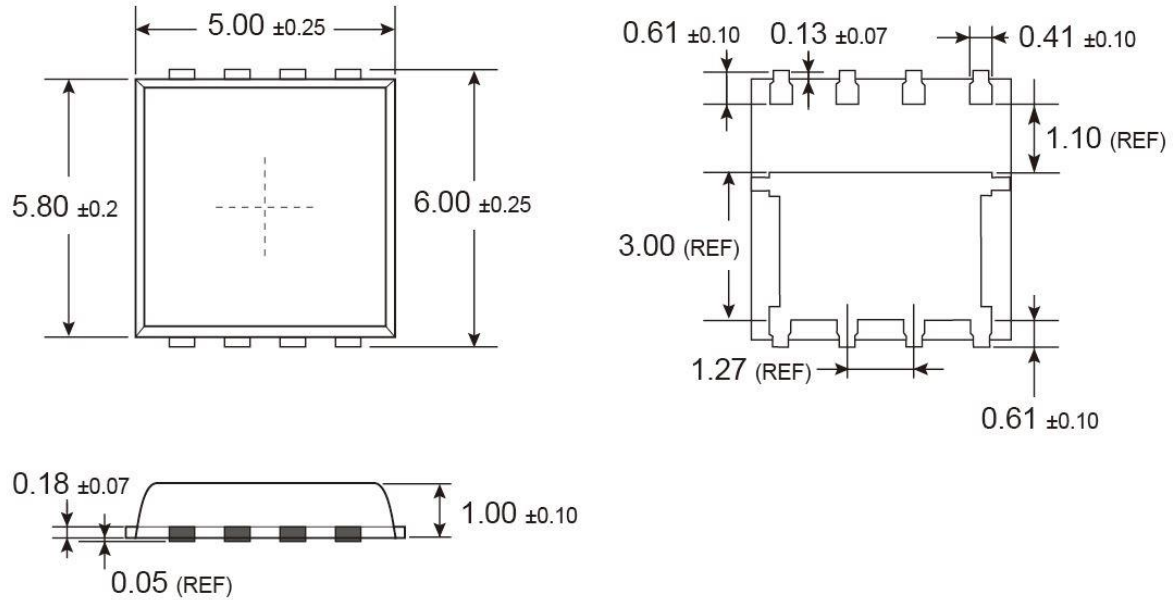
Notes:

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. $V_{DD} = 25V, V_{GS} = 10V, L = 0.1\text{mH}, I_{AS} = 42A, R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$.
3. Pulse test: pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
4. Essentially independent of operating temperature.

Electrical Characteristics Curves

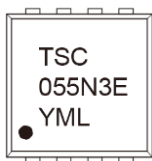


PDFN56 Mechanical Drawing



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

TSM055N03EPQ56

30V N-Channel MOSFET

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