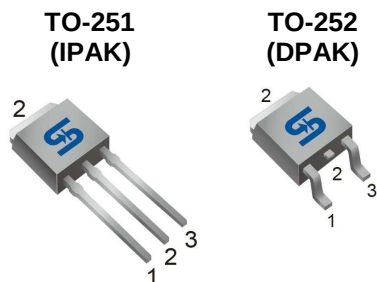


TSM600N25E

250V N-Channel Power MOSFET



Pin Definition:

1. Gate
2. Drain
3. Source

Key Parameter Performance

Parameter	Value	Unit
V_{DS}	250	V
$R_{DS(on)}(max)$	0.6	Ω
Q_g	8.4	nC

Features

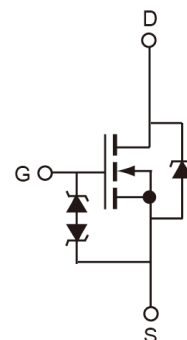
- 100% avalanche tested
- Improved ESD performance

Ordering Information

Part No.	Package	Packing
TSM600N25ECH C5G	TO-251	75pcs / Tube
TSM600N25ECP ROG	TO-252	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

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V _{DS}	250	V
Gate-Source Voltage		V _{GS}	±30	V
Continuous Drain Current	T _C = 25°C	I _D	8	A
	T _C = 100°C		3.6	A
Pulsed Drain Current ^(Note 1)		I _{DM}	32	A
Single Pulse Avalanche Energy ^(Note 2)		E _{AS}	147	mJ
Repetitive Avalanche Current ^(Note 1)		I _{AR}	8	A
Repetitive Avalanche Energy ^(Note 1)		E _{AR}	5.2	mJ
Power Dissipation @ T _C = 25°C		P _D	52	W
Peak Diode Recovery ^(Note 3)		dv/dt	4.5	V/ns
Operating Junction Temperature		T _J	150	°C
Storage Temperature Range		T _{STG}	-55 to +150	°C

Thermal Performance

Parameter	Symbol	Limit	Unit
Thermal Resistance - Junction to Case	$R_{\theta JC}$	2.4	$^\circ C/W$
Thermal Resistance - Junction to Ambient	$R_{\theta JA}$	110	

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

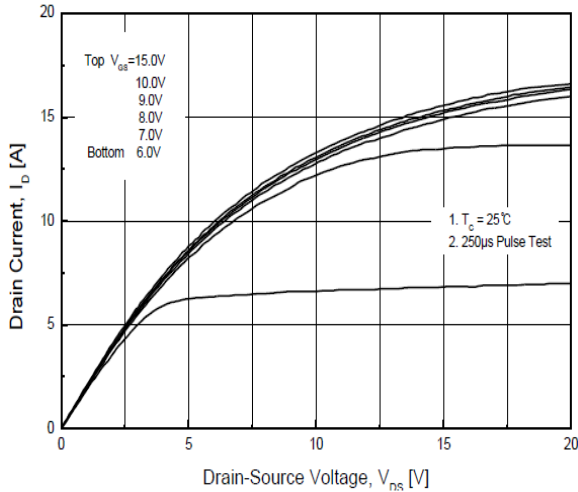
Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = 250μA	BV _{DSS}	250	--	--	V
Drain-Source On-State Resistance	V _{GS} = 10V, I _D = 4A	R _{DS(ON)}	--	0.5	0.6	Ω
Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	V _{GS(TH)}	3	--	5	V
Zero Gate Voltage Drain Current	V _{DS} = 250V, V _{GS} = 0V	I _{DSS}	--	--	1	μA
	V _{DS} = 200V, T _c = 125°C		--	--	10	
Gate Body Leakage	V _{GS} = ±30V, V _{DS} = 0V	I _{GSS}	--	--	±100	μA
Forward Transconductance ^(Note 4)	V _{DS} = 30V, I _D = 4A	g _{fs}	--	7.5	--	S
Dynamic						
Total Gate Charge ^(Note 4,5)	V _{DS} = 200V, I _D = 8A, V _{GS} = 10V	Q _g	--	8.4	--	nC
Gate-Source Charge ^(Note 4,5)		Q _{gs}	--	1.9	--	
Gate-Drain Charge ^(Note 4,5)		Q _{gd}	--	4	--	
Input Capacitance	V _{DS} = 25V, V _{GS} = 0V, f = 1.0MHz	C _{iss}	--	423	--	pF
Output Capacitance		C _{oss}	--	74	--	
Reverse Transfer Capacitance		C _{rss}	--	12	--	
Switching						
Turn-On Delay Time ^(Note 4,5)	V _{DD} = 125V, I _D = 8A, R _{GEN} =25Ω	t _{d(on)}	--	14	--	ns
Turn-On Rise Time ^(Note 4,5)		t _r	--	25	--	
Turn-Off Delay Time ^(Note 4,5)		t _{d(off)}	--	30	--	
Turn-Off Fall Time ^(Note 4,5)		t _f	--	14	--	
Source-Drain Diode Ratings and Characteristic						
Maximum Continuous Drain-Source Diode Forward Current		I _S	--	--	8	A
Maximum Pulse Drain-Source Diode Forward Current		I _{SM}	--	--	32	A
Diode-Source Forward Voltage	V _{GS} = 0V, I _S = 8A	V _{SD}	--	--	1.5	V
Reverse Recovery Time ^(Note 4)	V _{GS} = 0V, I _S = 8A dI _F /dt = 100A/μs	t _{rr}	--	157	--	ns
Reverse Recovery Charge ^(Note 4)		Q _{rr}	--	0.6	--	μC

Note:

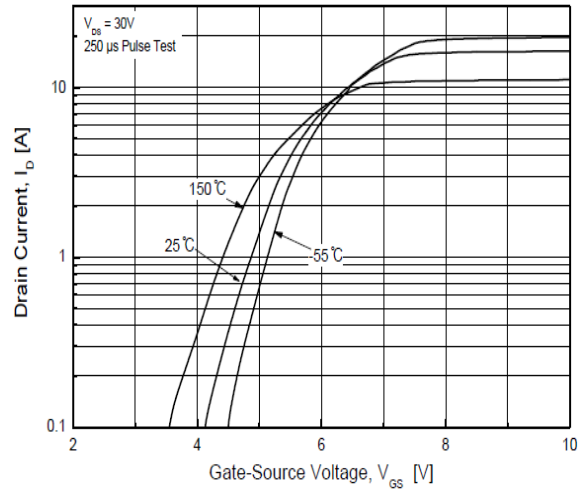
- Pulse width limited by safe operating area
- L=3.68mH, I_{AS} =8A, V_{DD} = 50V, R_G = 25Ω, Starting T_J = 25°C
- I_{SD} ≤8A, di/dt ≤ 200A/μs, V_{DD} ≤ BV_{DS}, Starting T_J=25°C
- Pulse test: pulse width ≤300μs, duty cycle ≤2%
- Switching time is essentially independent of operating temperature.

Electrical Characteristics Curves

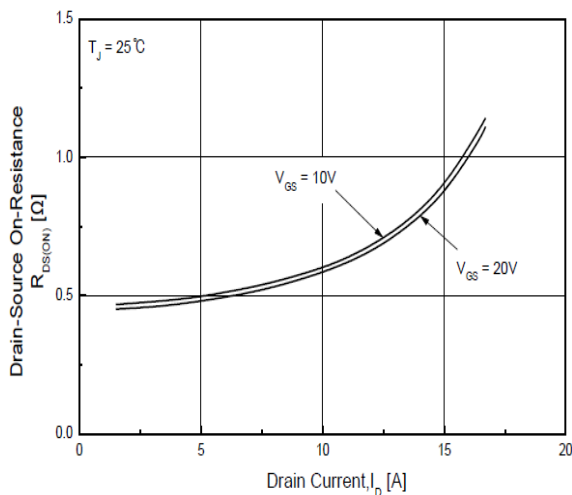
Output Characteristics



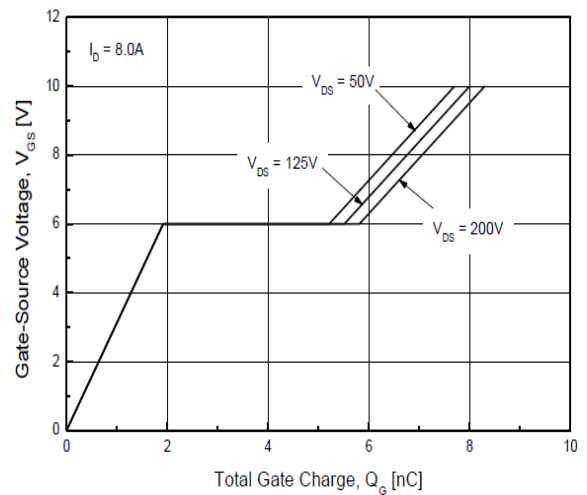
Transfer Characteristics



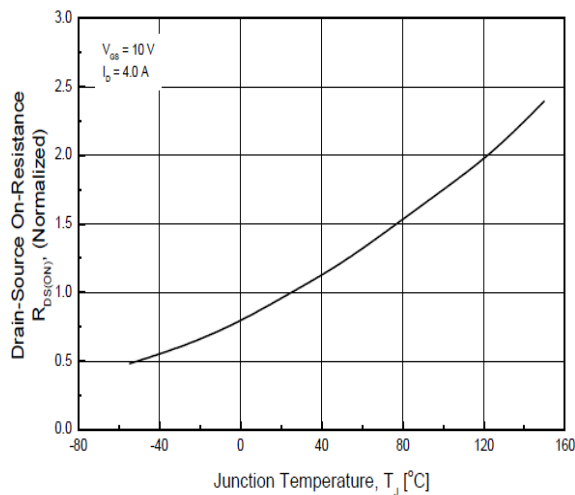
On-Resistance vs. Drain Current



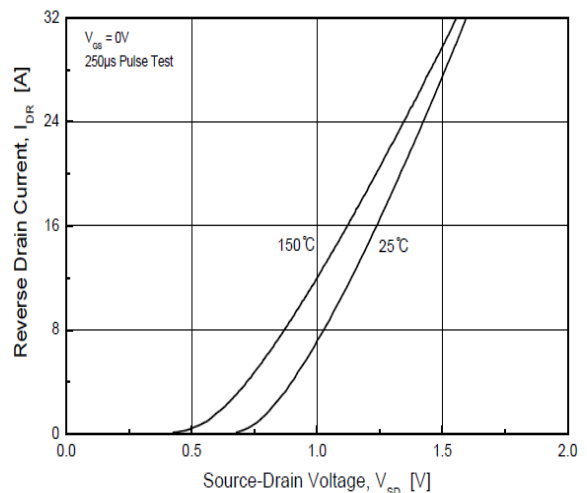
Gate Charge



On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage

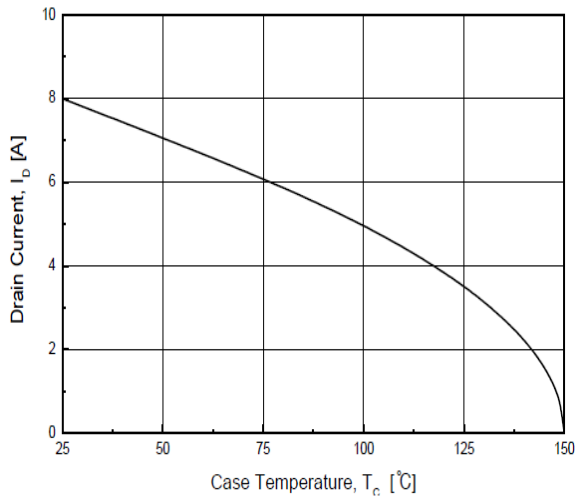


TSM600N25E

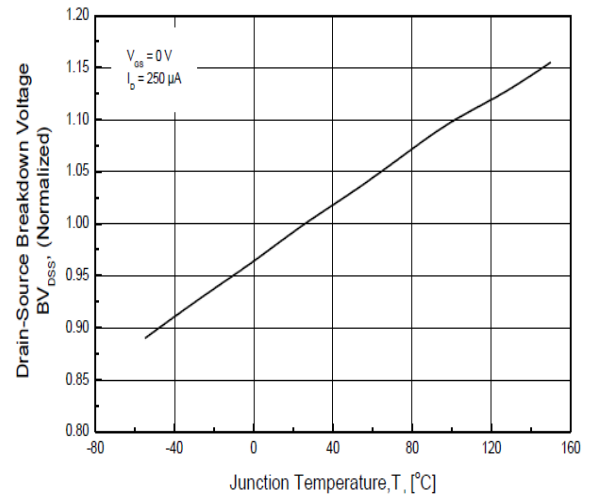
250V N-Channel Power MOSFET

Electrical Characteristics Curves

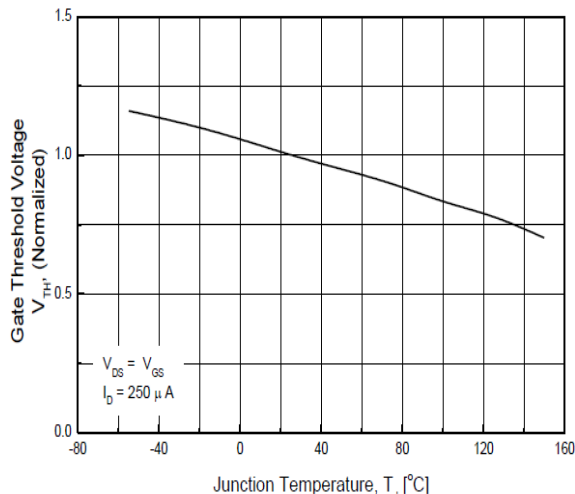
Drain Current vs. Case Temperature



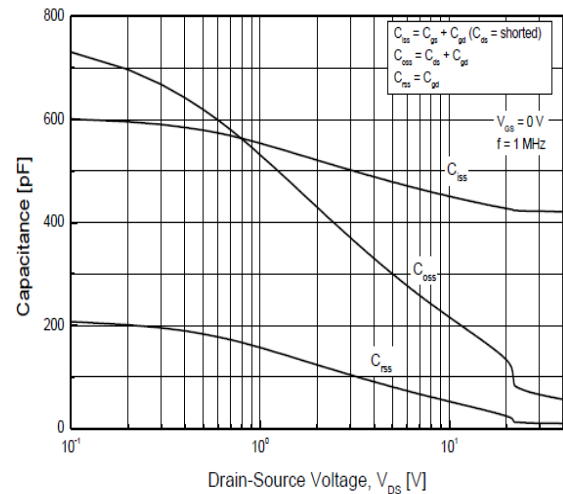
BV_{DSS} vs. Junction Temperature



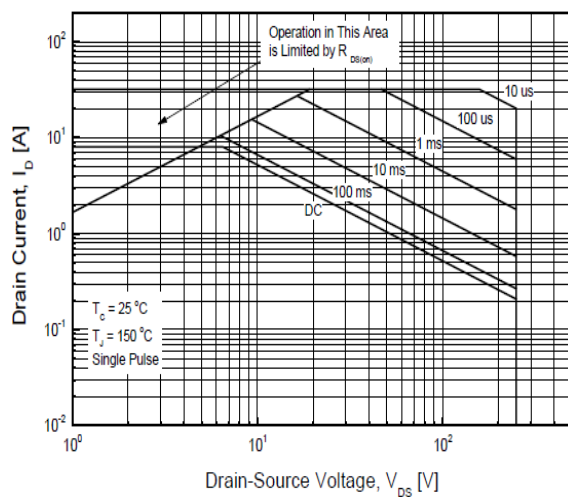
V_{TH} vs. Junction Temperature



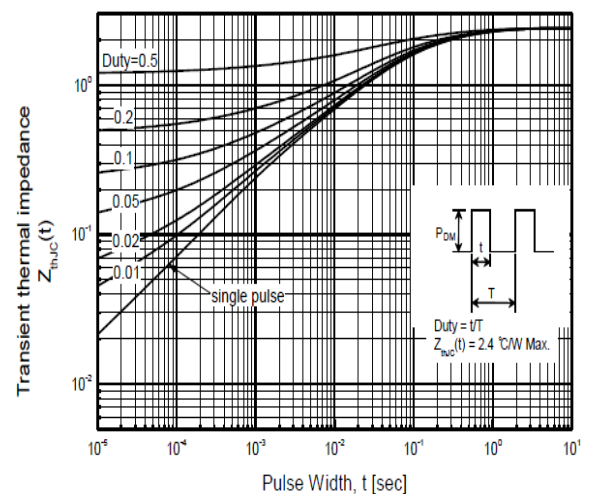
Capacitance vs. Drain-Source Voltage



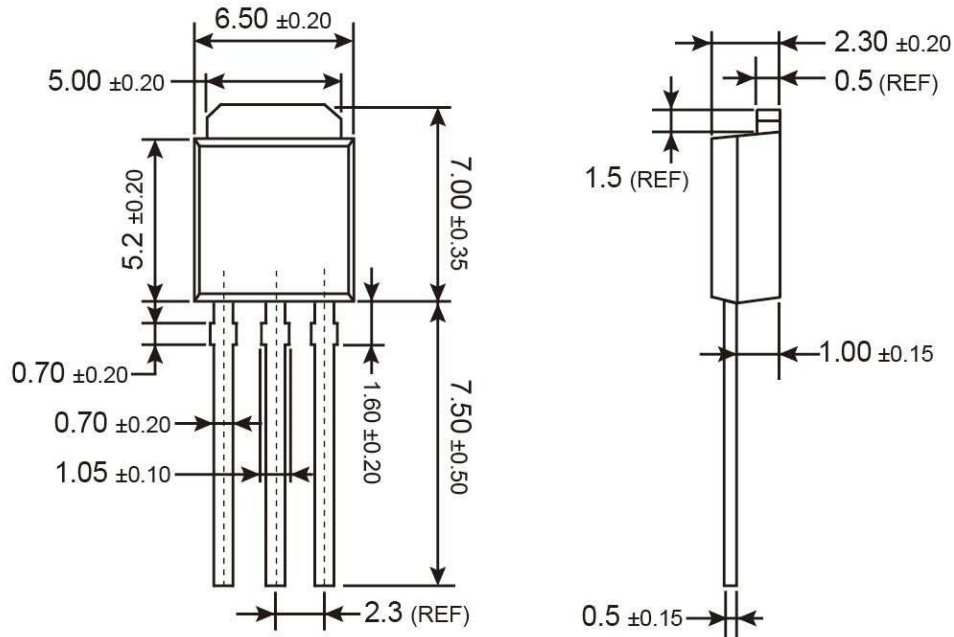
Maximum Safe Operating Area



Transient Thermal Impedance

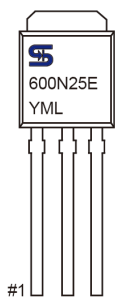


TO-251 Mechanical Drawing



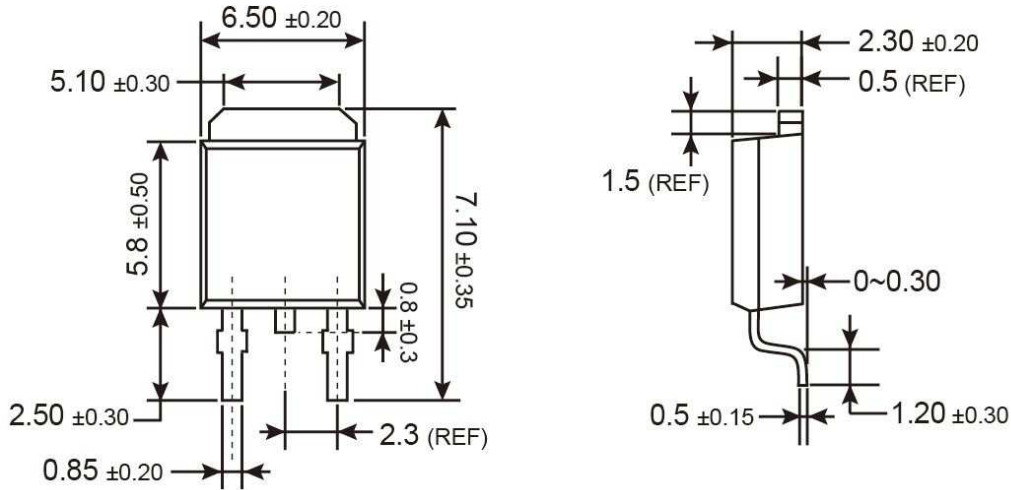
Unit: Millimeters

Marking Diagram



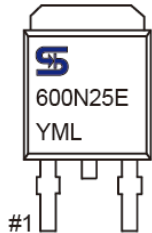
- Y** = Year Code
- M** = Month Code for Halogen Free Product
(**O**=Jan, **P**=Feb, **Q**=Mar, **R**=Apr, **S**=May, **T**=Jun, **U**=Jul, **V**=Aug, **W**=Sep, **X**=Oct, **Y**=Nov, **Z**=Dec)
- L** = Lot Code

TO-252 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)
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TSM600N25E

250V N-Channel Power MOSFET

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