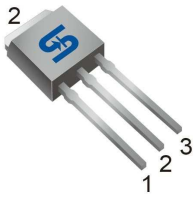
TAIWAN SEMICONDUCTOR

TSM600N25E

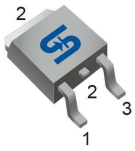
250V N-Channel Power MOSFET

Pb-Free RoHS COMPLIANT

TO-251 (IPAK)



TO-252 (DPAK)



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

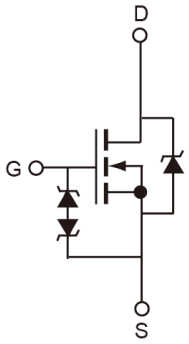
- 100% avalanche tested
- Improved ESD performance

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	Tc = 25ºC	I_D	8	A
	Tc = 100ºC		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	ºC
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	°C/W
Thermal Resistance - Junction to Ambient	$R_{\Theta JA}$	110	

TSM600N25E

250V N-Channel Power MOSFET

Pb-Free RoHS COMPLIANT

Electrical Specifications (Tc=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, Tc = 125ºC		--	--	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

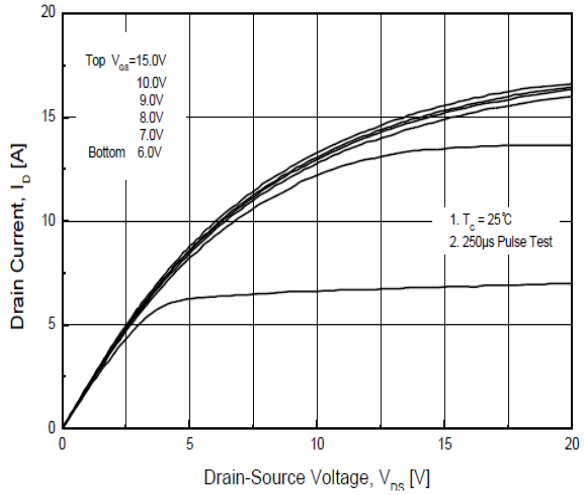
Note:

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

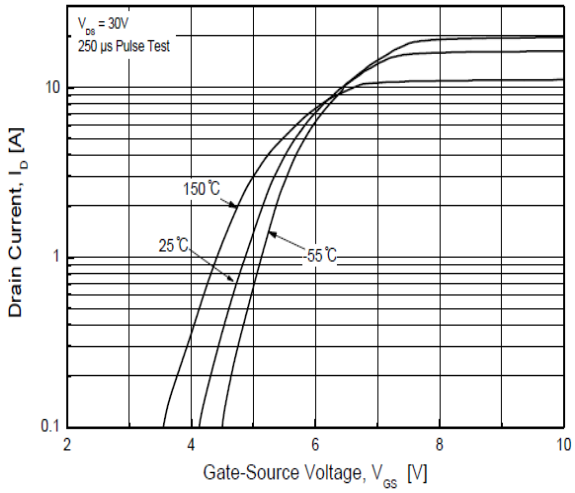
Pb-Free RoHS COMPLIANT

Electrical Characteristics Curves

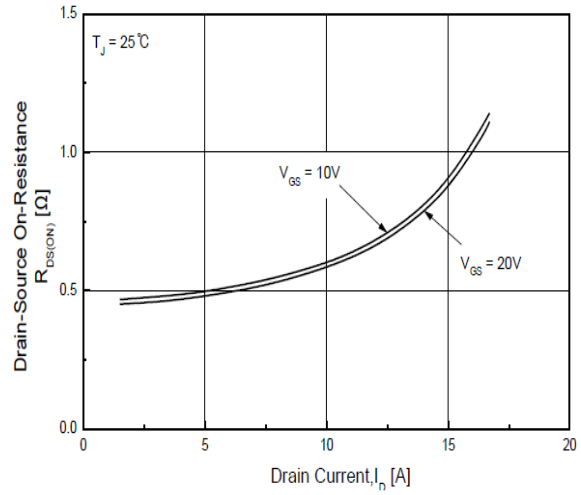
Output Characteristics



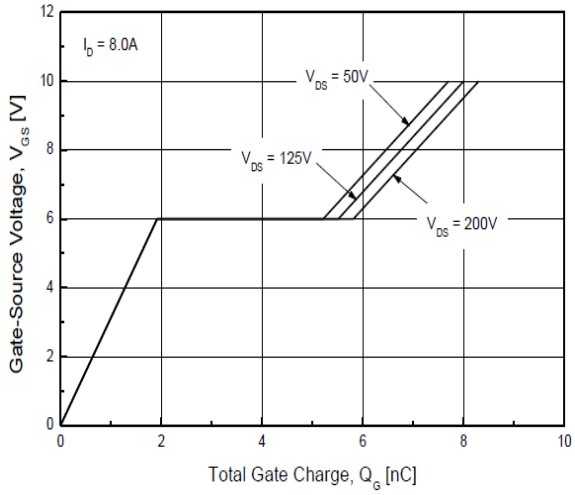
Transfer Characteristics



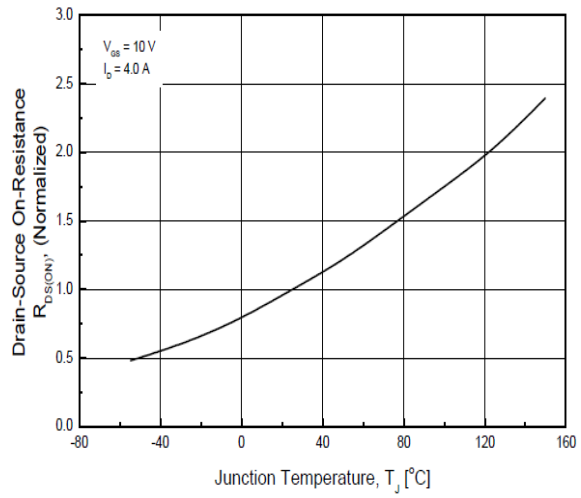
On-Resistance vs. Drain Current



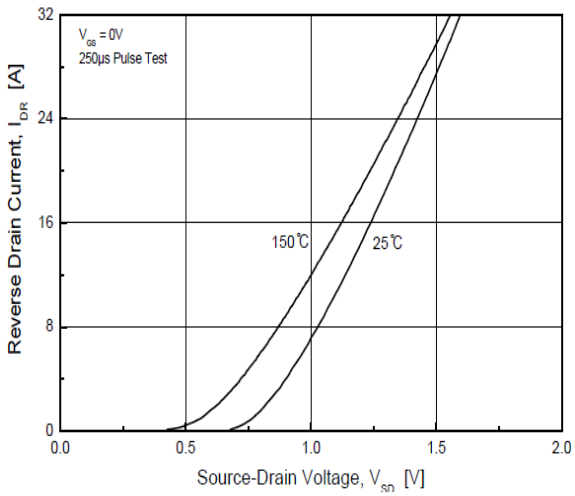
Gate Charge



On-Resistance vs. Junction Temperature



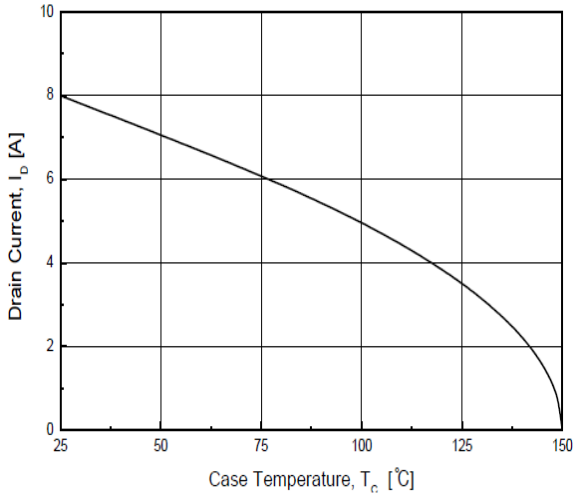
Source-Drain Diode Forward Voltage



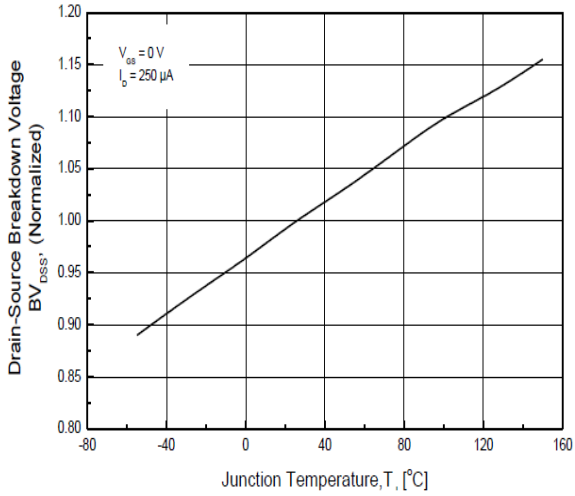
Pb-Free RoHS COMPLIANT

Electrical Characteristics Curves

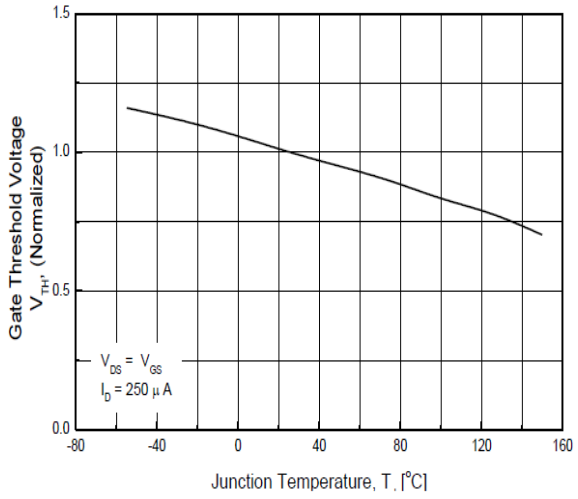
Drain Current vs. Case Temperature



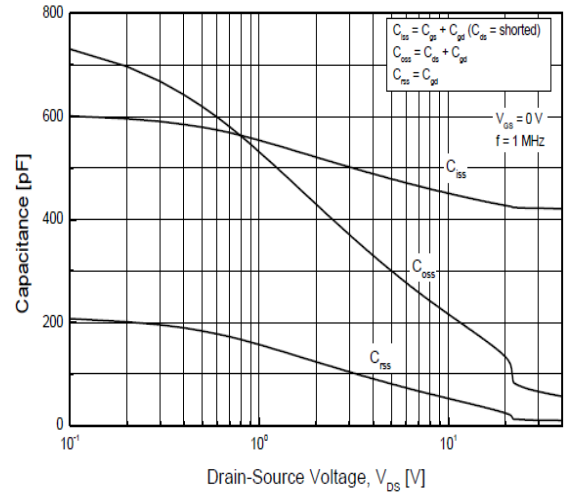
BV_{DSS} vs. Junction Temperature



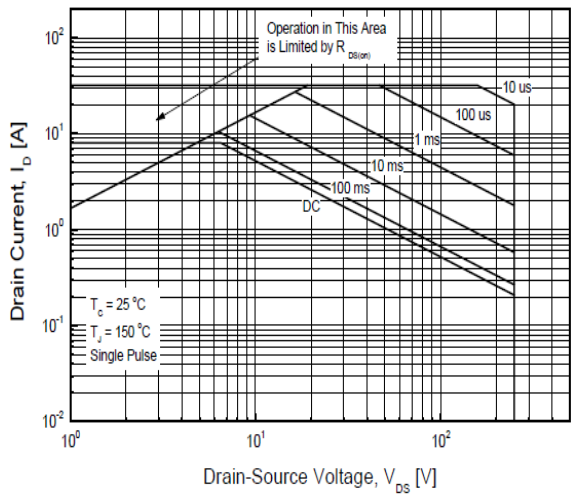
V_{TH} vs. Junction Temperature



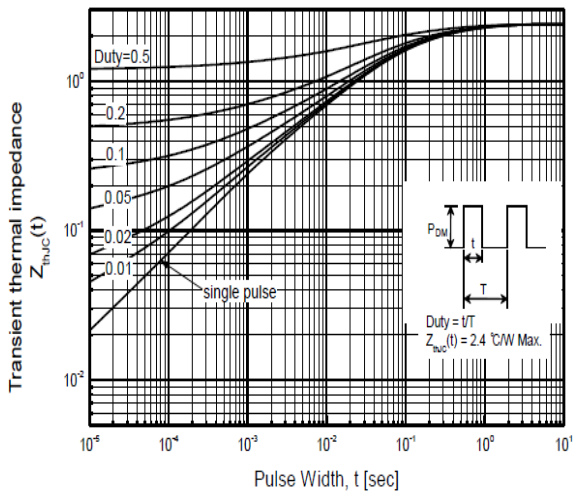
Capacitance vs. Drain-Source Voltage



Maximum Safe Operating Area

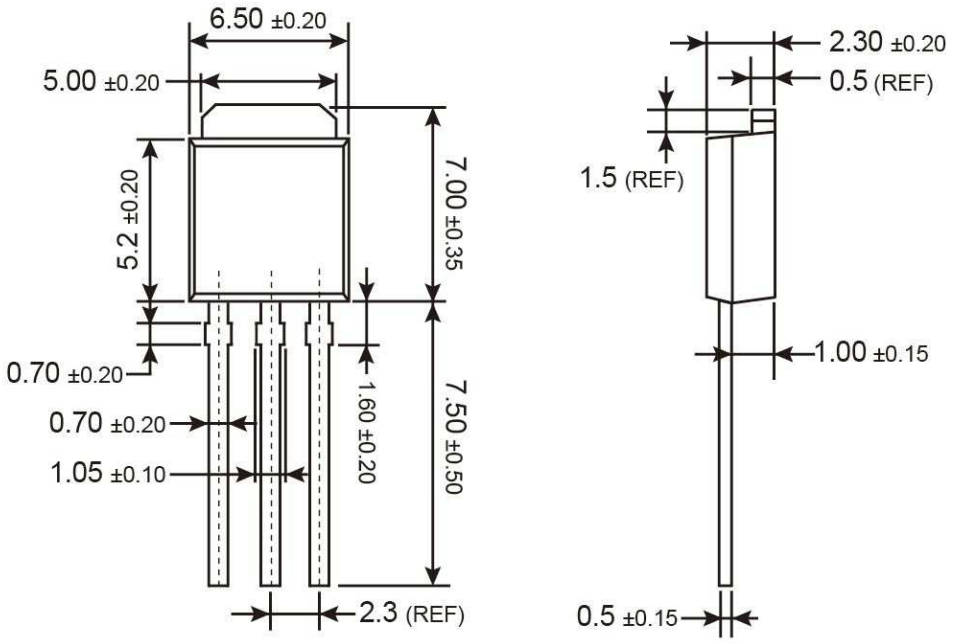


Transient Thermal Impedance



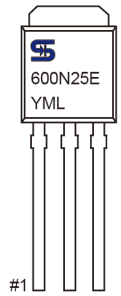
Pb-Free RoHS COMPLIANT

TO-251 Mechanical Drawing



Unit: Millimeters

Marking Diagram

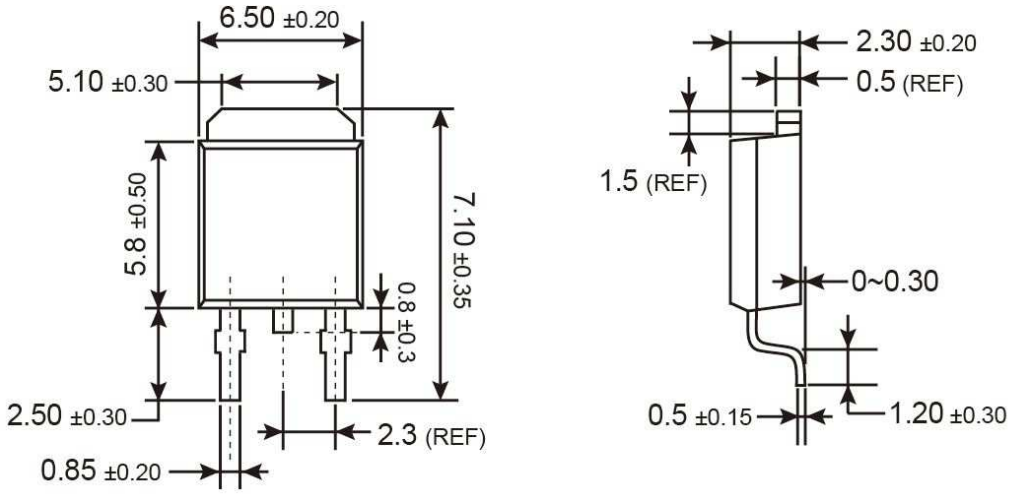


Y = Year Code

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

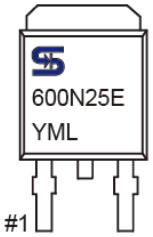
L = Lot Code

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**=Apl, **S**=May, **T**=Jun, **U**=Jul, **V**=Aug, **W**=Sep, **X**=Oct, **Y**=Nov, **Z**=Dec)

L = Lot Code

Notice

Specifications of the products displayed herein are subject to change without notice. TSC or anyone on its behalf, assumes no responsibility or liability for any errors or inaccuracies.

Information contained herein is intended to provide a product description only. No license, express or implied, to any intellectual property rights is granted by this document. Except as provided in TSC's terms and conditions of sale for such products, TSC assumes no liability whatsoever, and disclaims any express or implied warranty, relating to sale and/or use of TSC products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright, or other intellectual property right.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify TSC for any damages resulting from such improper use or sale.

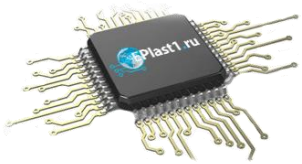
Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits,General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

Телефон: 8 (812) 309 58 32 (многоканальный)
Факс: 8 (812) 320-02-42
Электронная почта: org@eplast1.ru
Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.