

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

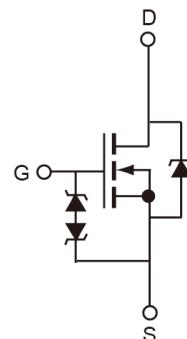
- 100% avalanche tested
- Improved ESD performance

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
		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_{eJC}	2.4	°C/W
Thermal Resistance - Junction to Ambient	R_{eJA}	110	

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

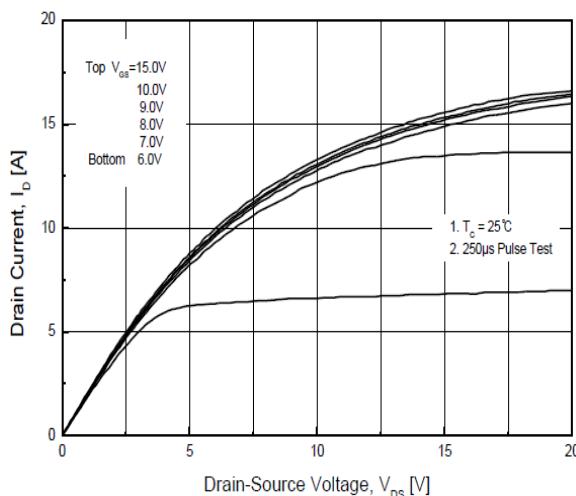
Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{GS} = 0\text{V}$, $I_D = 250\mu\text{A}$	BV_{DSS}	250	--	--	V
Drain-Source On-State Resistance	$V_{GS} = 10\text{V}$, $I_D = 4\text{A}$	$R_{DS(\text{ON})}$	--	0.5	0.6	Ω
Gate Threshold Voltage	$V_{DS} = V_{GS}$, $I_D = 250\mu\text{A}$	$V_{GS(\text{TH})}$	3	--	5	V
Zero Gate Voltage Drain Current	$V_{DS} = 250\text{V}$, $V_{GS} = 0\text{V}$	I_{DSS}	--	--	1	μA
	$V_{DS} = 200\text{V}$, $T_c = 125^\circ\text{C}$		--	--	10	
Gate Body Leakage	$V_{GS} = \pm 30\text{V}$, $V_{DS} = 0\text{V}$	I_{GSS}	--	--	± 100	μA
Forward Transconductance ^(Note 4)	$V_{DS} = 30\text{V}$, $I_D = 4\text{A}$	g_{fs}	--	7.5	--	S
Dynamic						
Total Gate Charge ^(Note 4,5)	$V_{DS} = 200\text{V}$, $I_D = 8\text{A}$, $V_{GS} = 10\text{V}$	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	$V_{DS} = 25\text{V}$, $V_{GS} = 0\text{V}$, $f = 1.0\text{MHz}$	C_{iss}	--	423	--	pF
Output Capacitance		C_{oss}	--	74	--	
Reverse Transfer Capacitance		C_{rss}	--	12	--	
Switching						
Turn-On Delay Time ^(Note 4,5)	$V_{DD} = 125\text{V}$, $I_D = 8\text{A}$, $R_{GEN} = 25\Omega$	$t_{d(on)}$	--	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	$V_{GS} = 0\text{V}$, $I_S = 8\text{A}$	V_{SD}	--	--	1.5	V
Reverse Recovery Time ^(Note 4)	$V_{GS} = 0\text{V}$, $I_S = 8\text{A}$	t_{rr}	--	157	--	ns
Reverse Recovery Charge ^(Note 4)	$dI_F/dt = 100\text{A}/\mu\text{s}$	Q_{rr}	--	0.6	--	μC

Note:

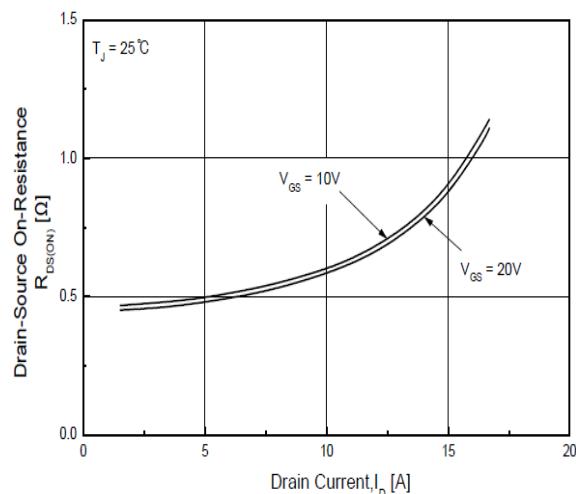
1. Pulse width limited by safe operating area
2. $L=3.68\text{mH}$, $I_{AS}=8\text{A}$, $V_{DD}=50\text{V}$, $R_G=25\Omega$, Starting $T_J=25^\circ\text{C}$
3. $I_{SD}\leq 8\text{A}$, $di/dt\leq 200\text{A}/\mu\text{s}$, $V_{DD}\leq BV_{DS}$, Starting $T_J=25^\circ\text{C}$
4. Pulse test: pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$
5. Switching time is essentially independent of operating temperature.

Electrical Characteristics Curves

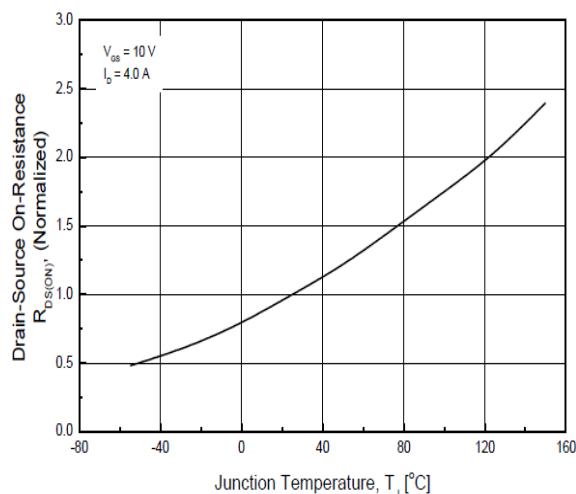
Output Characteristics



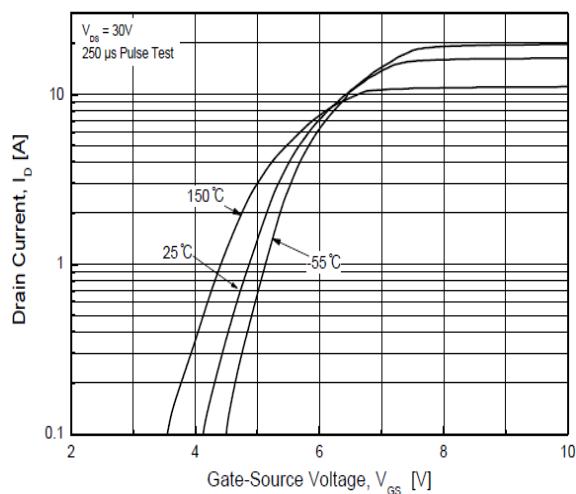
On-Resistance vs. Drain Current



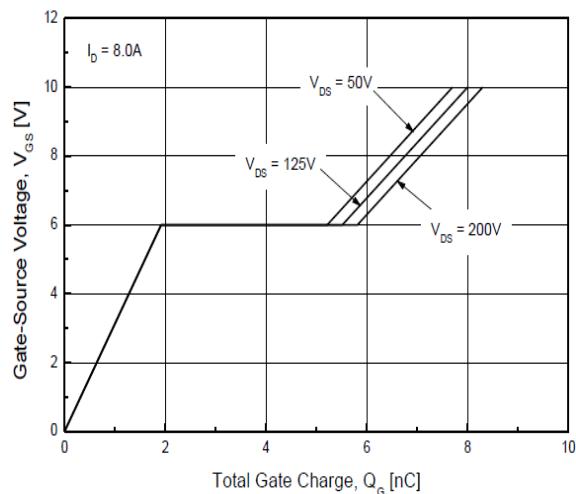
On-Resistance vs. Junction Temperature



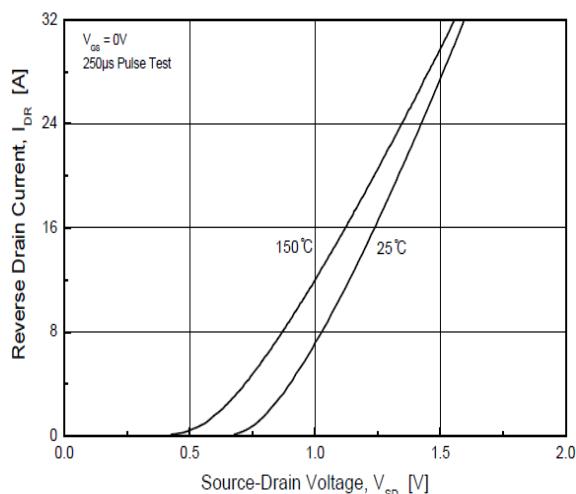
Transfer Characteristics



Gate Charge

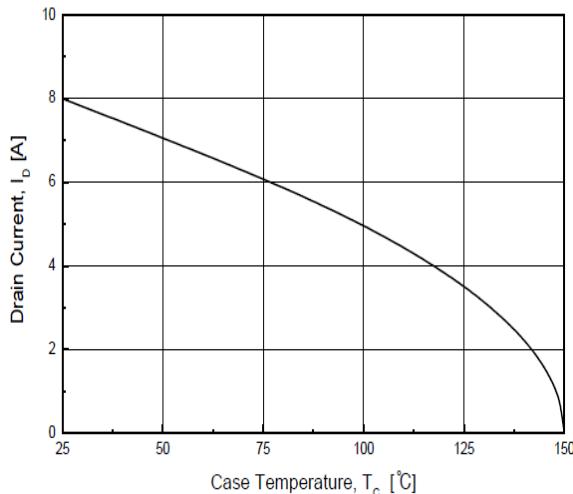


Source-Drain Diode Forward Voltage

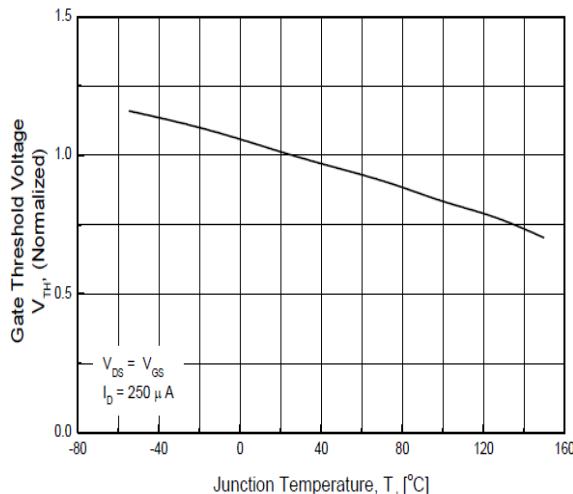


Electrical Characteristics Curves

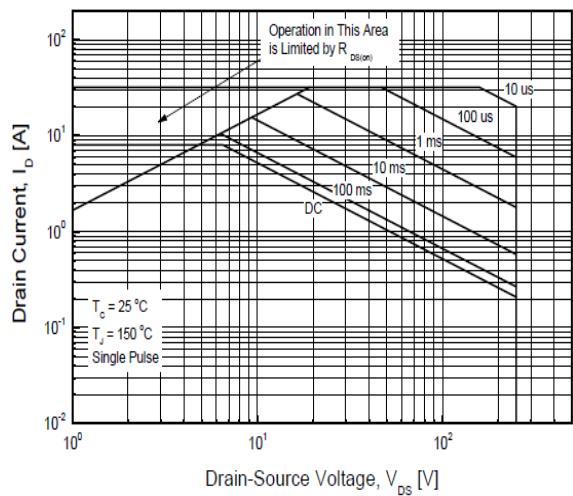
Drain Current vs. Case Temperature



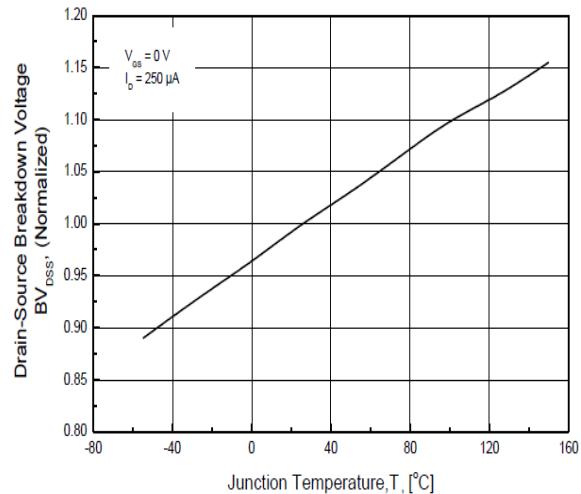
V_{TH} vs. Junction Temperature



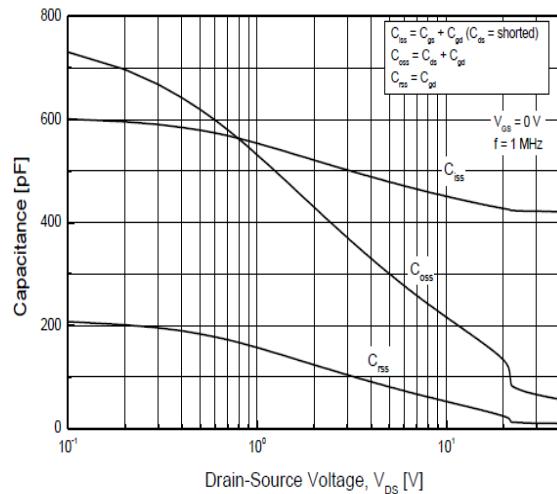
Maximum Safe Operating Area



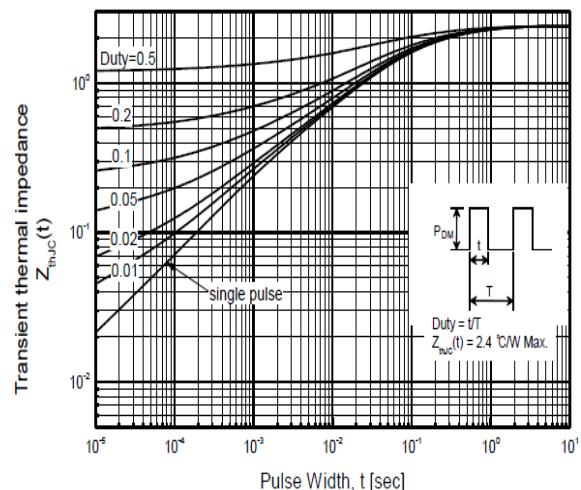
BV_{DSS} vs. Junction Temperature



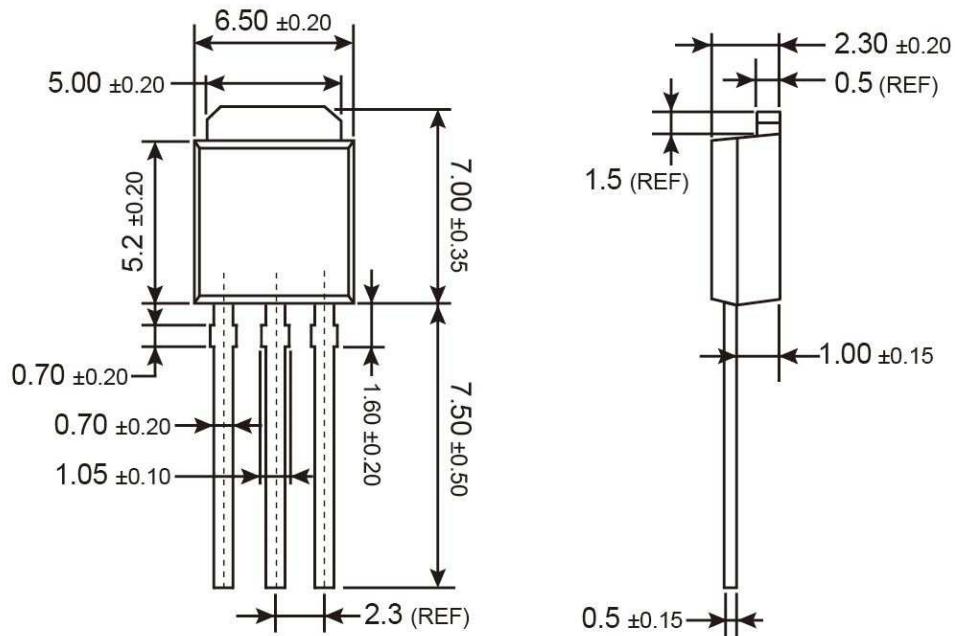
Capacitance vs. Drain-Source Voltage



Transient Thermal Impedance

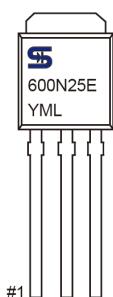


TO-251 Mechanical Drawing



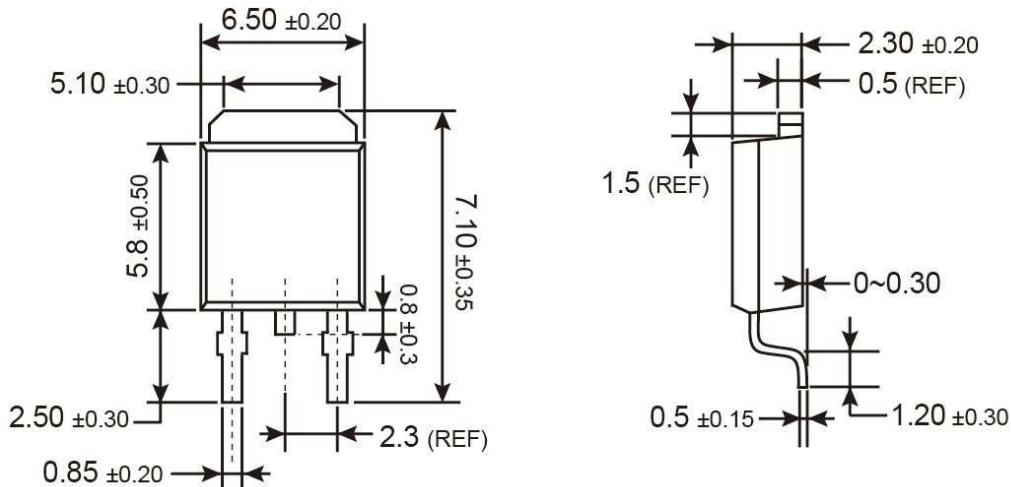
Unit: Millimeters

Marking Diagram



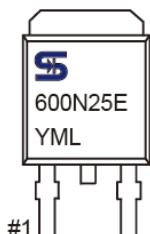
- Y** = Year Code
- M** = Month Code for Halogen Free Product
(O=Jan, P=Feb, Q=Mar, R=Apl, S=May, T=Jun, U=Jul, V=Aug, W=Sep,
X=Oct, Y=Nov, Z=Dec)
- L** = Lot Code

TO-252 Mechanical Drawing



Unit: Millimeters

Marking Diagram



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