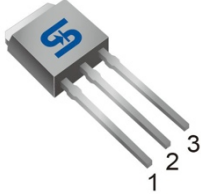


TSM6N60

600V N-Channel Power MOSFET

TO-251
(IPAK)



TO-252
(DPAK)



Pin Definition:

1. Gate
2. Drain
3. Source

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)
600	1.25 @ $V_{GS} = 10V$	6

Features

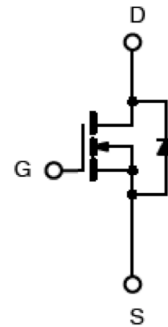
- High power and current handing capability.
- Low $R_{DS(on)}$ 1.25 Ω (Max.)
- Low gate charge typical @ 20.7nC (Typ.)

Ordering Information

Part No.	Package	Packing
TSM6N60CH C5G	TO-251	75pcs / Tube
TSM6N60CP ROG	TO-252	2.5kpcs / 13" Reel

Note: "G" denotes for Halogen Free

Block Diagram



N-Channel MOSFET

Absolute Maximum Ratings (Tc = 25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	600	V
Gate-Source Voltage	V_{GS}	± 30	V
Continuous Drain Current	I_D	6	A
		4.2	A
Pulsed Drain Current ^(Note 1)	I_{DM}	24	A
Single Pulse Avalanche Energy ^(Note 2)	E_{AS}	180	mJ
Total Power Dissipation @ T _C = 25°C	P_{TOT}	89	W
Operating Junction Temperature	T_J	150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C

Note1: Repetitive Rating : Pulse width limited by maximum junction temperature.

Note2: L=10mH, I_{AS} =6.0A, V_{DD} = 50V, R_G = 25 Ω , Starting T_J = 25°C

Thermal Performance

Parameter	Symbol	Limit	Unit
Thermal Resistance - Junction to Case	$R_{\theta JC}$	1.4	°C/W
Thermal Resistance - Junction to Ambient	$R_{\theta JA}$	50	

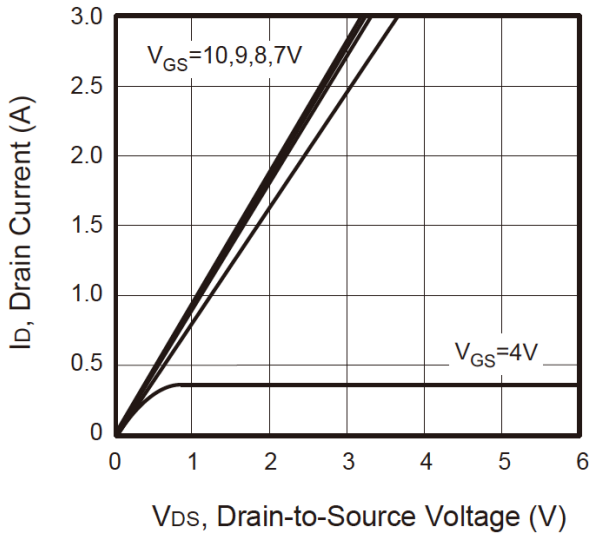
Electrical Specifications (T_c = 25°C unless otherwise noted)

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	BV_{DSS}	600	--	--	V
Drain-Source On-State Resistance	$V_{GS} = 10V, I_D = 3.0A$	$R_{DS(ON)}$	--	1.1	1.25	Ω
Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	$V_{GS(TH)}$	2	2.75	4	V
Zero Gate Voltage Drain Current	$V_{DS} = 600V, V_{GS} = 0V$	I_{DSS}	--	--	1	μA
Gate Body Leakage	$V_{GS} = \pm 30V, V_{DS} = 0V$	I_{GSS}	--	--	± 100	nA
Dynamic ^(Note a)						
Total Gate Charge	$V_{DS} = 480V, I_D = 6A,$ $V_{GS} = 10V$	Q_g	--	20.7	28	nC
Gate-Source Charge		Q_{gs}	--	5.1	--	
Gate-Drain Charge		Q_{gd}	--	5.4	--	
Input Capacitance	$V_{DS} = 25V, V_{GS} = 0V,$ $f = 1.0MHz$	C_{iss}	--	1248	--	pF
Output Capacitance		C_{oss}	--	117	--	
Reverse Transfer Capacitance		C_{rss}	--	11.3	--	
Switching ^(Note a)						
Turn-On Delay Time	$V_{GS} = 10V, I_D = 6A,$ $V_{DD} = 300V, R_{GEN} = 25\Omega$	$t_{d(on)}$	--	21	44	ns
Turn-On Rise Time		t_r	--	7.6	15	
Turn-Off Delay Time		$t_{d(off)}$	--	57	107	
Turn-Off Fall Time		t_f	--	6.2	8	
Source-Drain Diode Ratings and Characteristic						
Source Current		I_S	--	--	6.0	A
Diode Forward Voltage	$I_S = 6.0A, V_{GS} = 0V$	V_{SD}	--	0.86	1.5	V

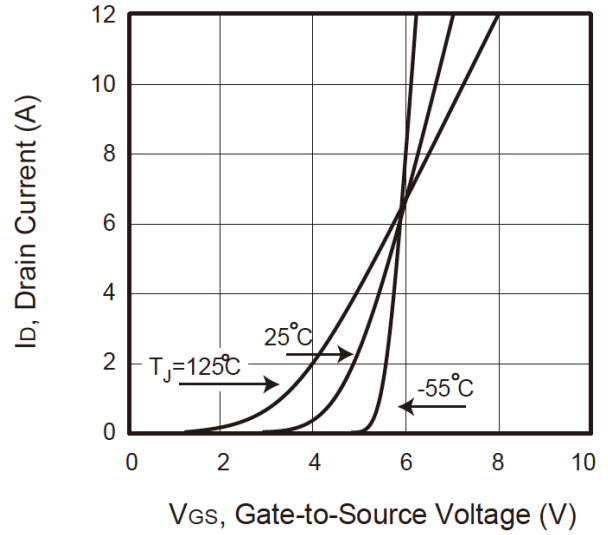
Note: Pulse Width < 300μs, Duty Cycle < 2%.

Electrical Characteristics Curve (Tc = 25°C, unless otherwise noted)

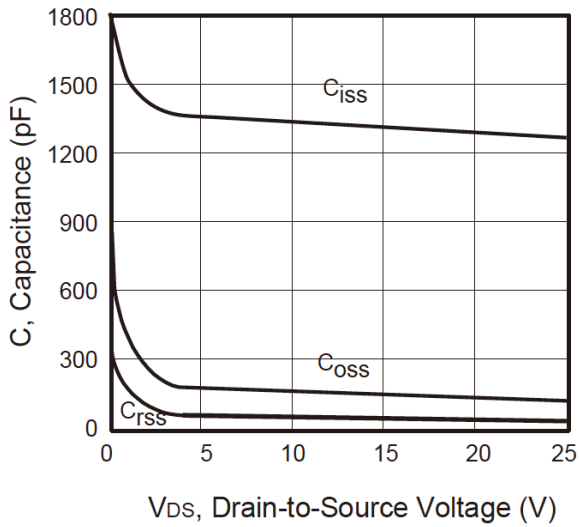
Output Characteristics



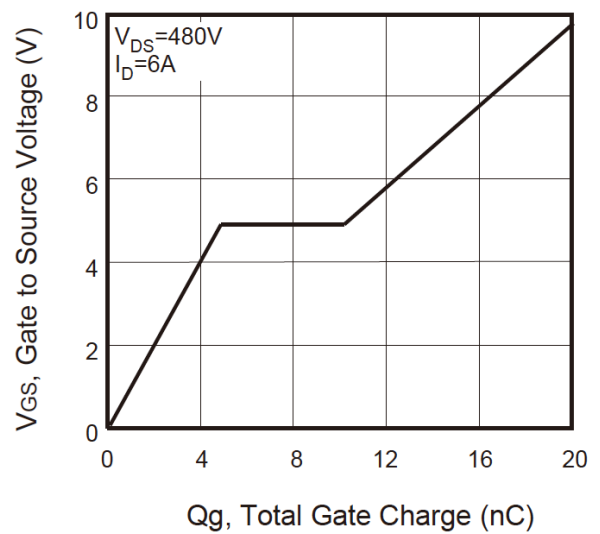
Transfer Characteristics



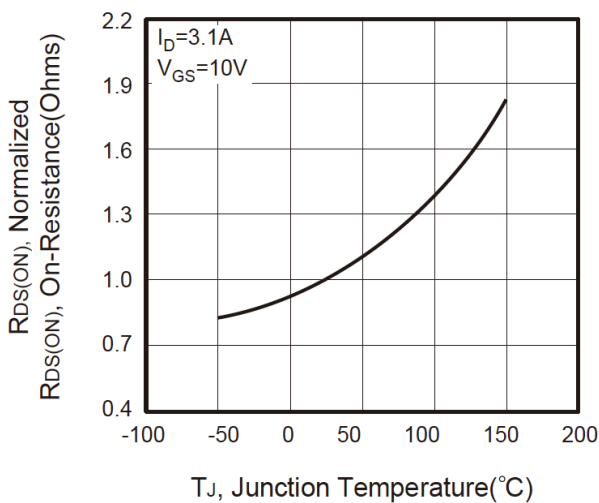
Capacitance



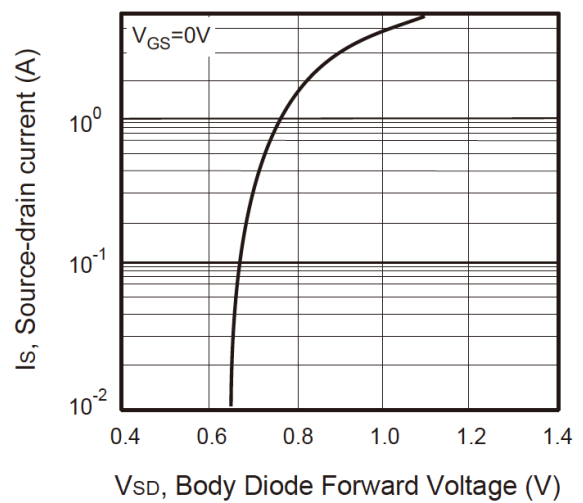
Gate Charge



On-Resistance vs. Junction Temperature

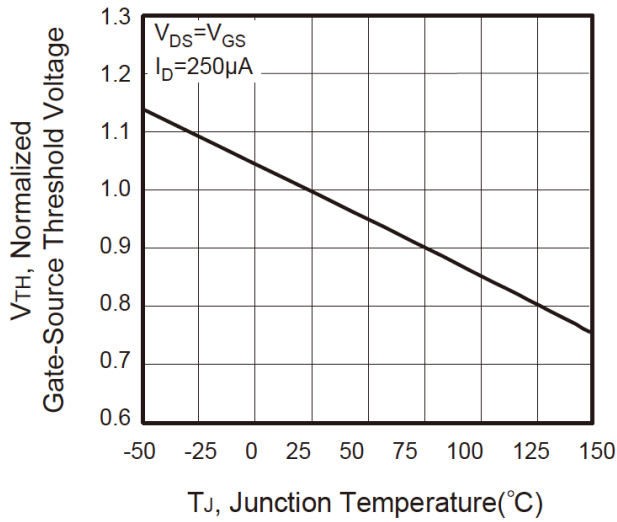


Source-Drain Diode Forward Voltage

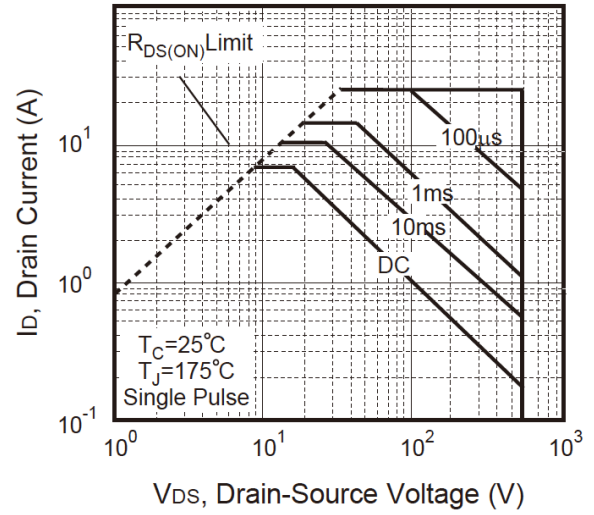


Electrical Characteristics Curve ($T_a = 25^\circ\text{C}$, unless otherwise noted)

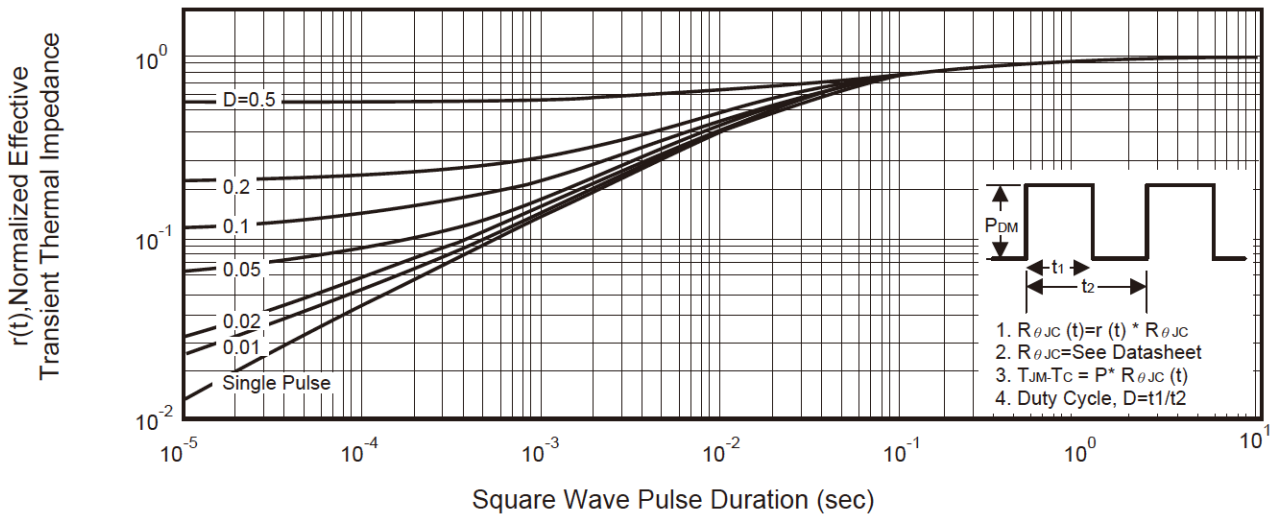
Threshold Voltage vs. Junction Temperature



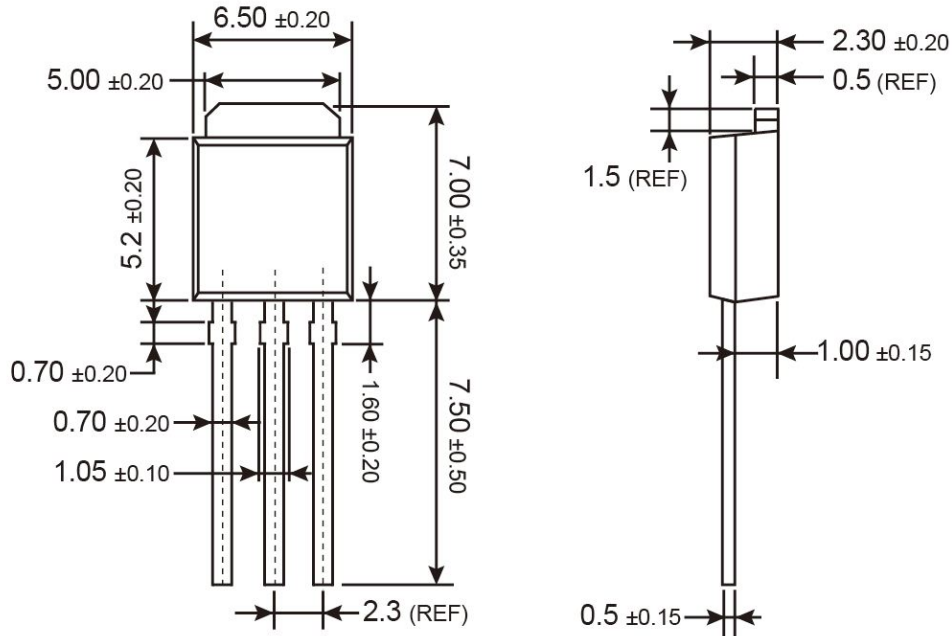
Maximum Safe Operating Area



Normalized Thermal Transient Impedance Curve

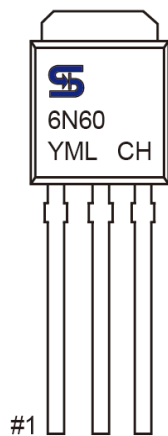


TO-251 Mechanical Drawing



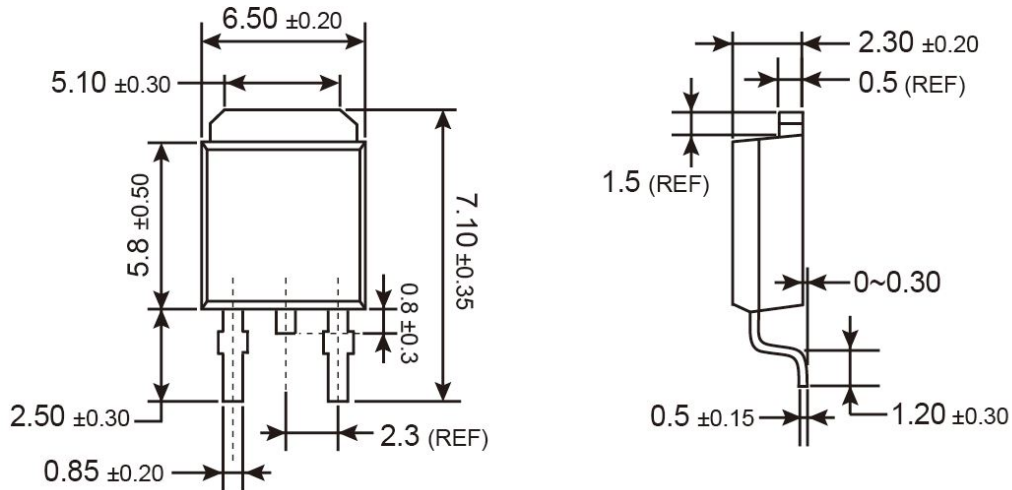
Unit: Millimeters

Marking Diagram



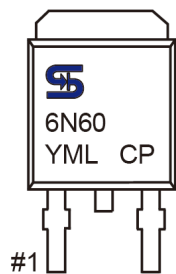
- Y** = Year Code
- M** = Month Code for Halogen Free Product
(**O**=Jan, **P**=Feb, **Q**=Mar, **R**=Apr, **S**=May, **T**=Jun, **U**=Jul, **V**=Aug, **W**=Sep, **X**=Oct, **Y**=Nov, **Z**=Dec)
- L** = Lot Code

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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