Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

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Email & Skype: info@chipsmall.com Web: www.chipsmall.com
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

30V N-Channel Power MOSFET

30V, 50A, 9mΩ

FEATURES

- Fast switching
- Halogen Free
- G-S ESD Protection Diode Embedded

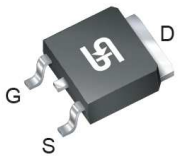
KEY PERFORMANCE PARAMETERS			
PARAMETER		**VALUE**	**UNIT**
V_{DS}		30	V
$R_{DS(on)}$ (max)	V_{GS} = 10V	9	mΩ
	V_{GS} = 4.5V	14	
Q_g		7.5	nC

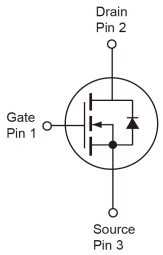
APPLICATION

- MB / VGA / Vcore
- POL Applications
- SMPS 2nd SR

Pb-Free RoHS COMPLIANT HALOGEN FREE

TO-252 (DPAK)





Notes: Moisture sensitivity level: level 3. Per J-STD-020

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	T_C = 25°C	I_D	50	A
	T_C = 100°C		32	
Pulsed Drain Current (Note 1)		I_{DM}	200	A
Total Power Dissipation	T_C = 25°C	P_D	40	W
	Derate above T_C = 25°C		0.32	W/°C
Single Pulsed Avalanche Energy (Note 2)		E_{AS}	45	mJ
Single Pulsed Avalanche Current (Note 2)		I_{AS}	30	A
Operating Junction Temperature		T_J	150	°C
Storage Temperature Range		T_{STG}	- 55 to +150	°C

THERMAL PERFORMANCE

PARAMETER	SYMBOL	LIMIT	UNIT
Junction to Case Thermal Resistance	$R_{\Theta JC}$	3.1	°C/W
Junction to Ambient Thermal Resistance	$R_{\Theta JA}$	62	°C/W

Notes: $R_{\Theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistances. The case thermal reference is defined at the solder mounting surface of the drain pins. $R_{\Theta JA}$ is guaranteed by design while $R_{\Theta CA}$ is determined by the user's board design. $R_{\Theta JA}$ shown below for single device operation on FR-4 PCB in still air.

ELECTRICAL SPECIFICATIONS (T_J = 25°C unless otherwise noted)

PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNIT
Static (Note3)						
Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 250μA	BV_{DSS}	30	--	--	V
Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	$V_{GS(TH)}$	1.2	1.6	2.5	V
Gate Body Leakage	V_{GS} = ±20V, V_{DS} = 0V	I_{GSS}	--	--	±10	μA
Zero Gate Voltage Drain Current	V_{DS} = 30V, V_{GS} = 0V	I_{DSS}	--	--	1	μA
	V_{DS} = 24V, T_J = 125ºC		--	--	10	
Forward Transconductance	V_{DS} = 10V, I_D = 8A	g_{fs}	--	9.5	--	S
Drain-Source On-State Resistance	V_{GS} = 10V, I_D = 16A	$R_{DS(ON)}$	--	7.5	9	mΩ
	V_{GS} = 4.5V, I_D = 8A		--	9.6	14	
Dynamic (Note4)						
Total Gate Charge	V_{DS} = 15V, I_D = 20A, V_{GS} = 4.5V	Q_g	--	7.7	--	nC
Gate-Source Charge		Q_{gs}	--	1.9	--	
Gate-Drain Charge		Q_{gd}	--	2.8	--	
Input Capacitance	V_{DS} = 25V, V_{GS} = 0V, f = 1MHz	C_{iss}	--	680	--	pF
Output Capacitance		C_{oss}	--	150	--	
Reverse Transfer Capacitance		C_{rss}	--	70	--	
Gate Resistance	V_{GS}=0V,V_{DS}=0V, f=1MHz	R_g	--	2.7	--	Ω
Switching (Note5)						
Turn-On Delay Time	V_{DD}=15V , V_{GS}=10V , R_G=3.3Ω, I_D=-15A	$t_{d(on)}$	--	4.8	--	ns
Turn-On Rise Time		t_r	--	12.5	--	
Turn-Off Delay Time		$t_{d(off)}$	--	27.6	--	
Turn-Off Fall Time		t_f	--	8.2	--	
Source-Drain Diode (Note3)						
Forward Voltage	V_{GS} = 0V, I_S = 1A	V_{SD}	--	--	1	V
Continuous Drain-Source Diode	V_G=V_D=0V Force Current	I_S	--	--	50	A
Pulse Drain-Source Diode		I_{SM}	--	--	200	A

Notes:

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=30A, R_G=25Ω, Starting T_J=25℃.
3. Pulse test: PW ≤ 300μs, duty cycle ≤ 2%
4. For DESIGN AID ONLY, not subject to production testing.
5. Switching time is essentially independent of operating temperature

ORDERING INFORMATION

PART NO.	PACKAGE	PACKING
TSM090N03ECP ROG	TO-252	2,500pcs / 13” Reel

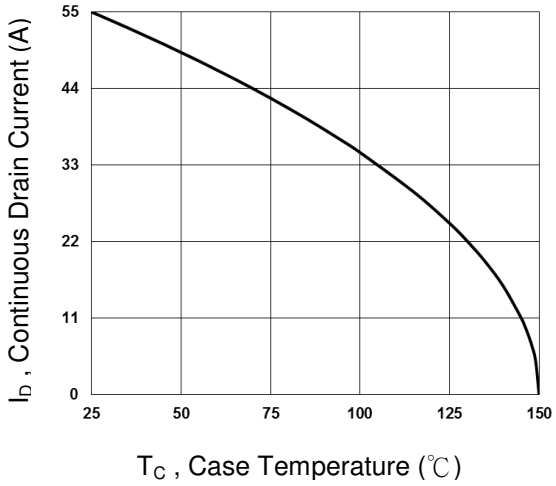
Note:

1. Compliant to RoHS Directive 2011/65/EU and in accordance to WEEE 2002/96/EC
2. Halogen-free according to IEC 61249-2-21 definition

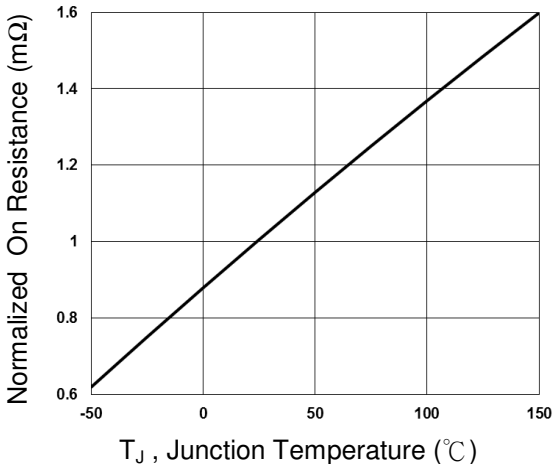
CHARACTERISTICS CURVES

(T_C = 25°C unless otherwise noted)

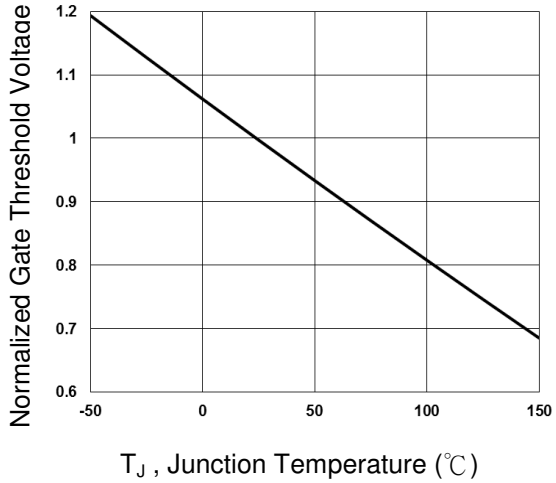
Continuous Drain Current vs. Tc



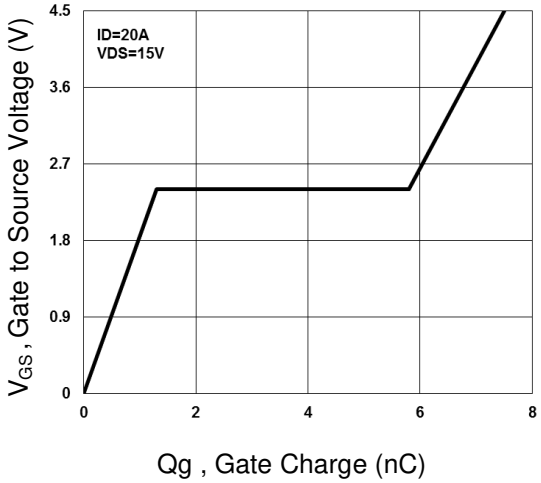
Normalized RDSON vs. T_J



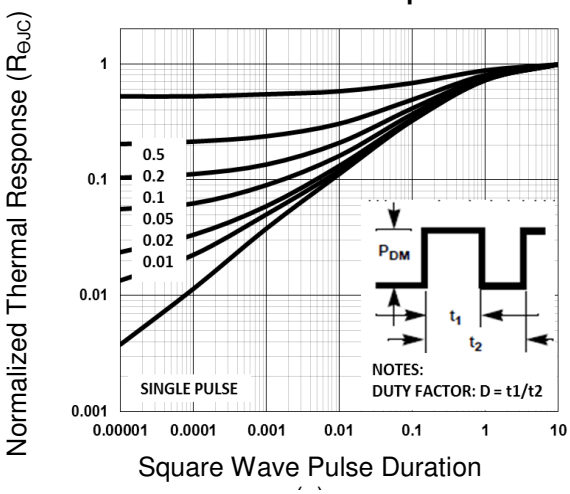
Normalized V_{th} vs. T_J



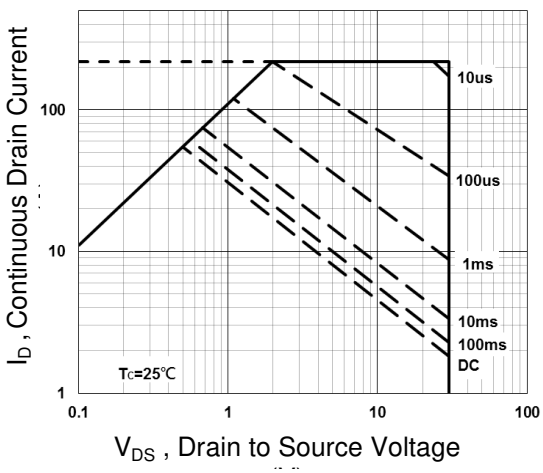
Gate Charge Waveform



Normalized Transient Impedance

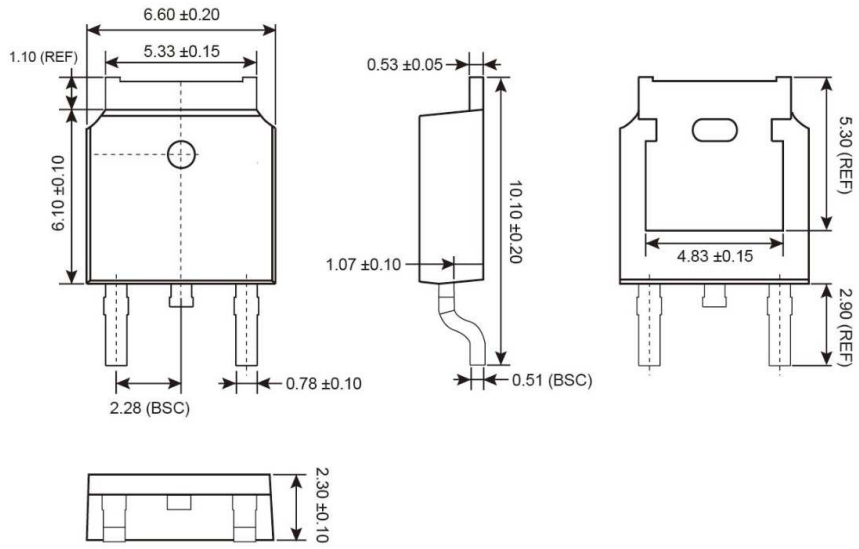


Maximum Safe Operation Area

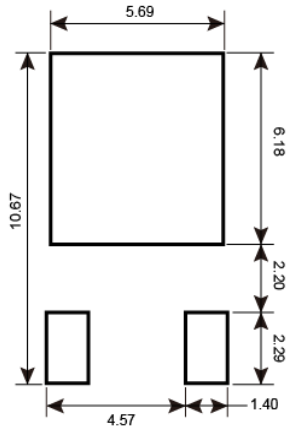


PACKAGE OUTLINE DIMENSIONS (Unit: Millimeters)

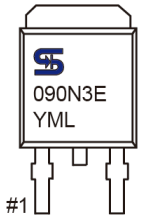
TO-252



SUGGESTED PAD LAYOUT (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

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