

MSW9N90

900V N-Channel MOSFET

Description

This latest technology has been especially designed to minimize on-state resistance, have a high rugged avalanche characteristics. These devices are well suited for high efficiency switch mode power supplies.

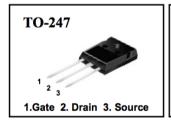
Features

- RDS(on) (Max 1.4 Ω)@VGS=10V
- Gate Charge (Typical 45nC)
- Improved dv/dt Capability, High Ruggedness
- 100% Avalanche Tested
- Maximum Junction Temperature Range (150°C)
- · RoHS compliant package

Package type: TO-247

Packing & Order Information

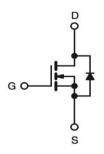
50/Tube; 1,000/Box

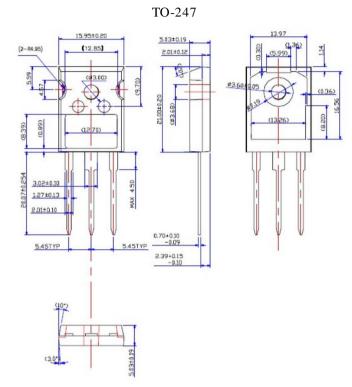




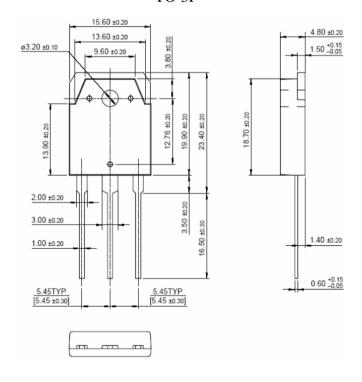
RoHS COMPLIANT

Graphic symbol





TO-3P





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MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Absolute 1	Absolute Maximum Ratings (Tc=25°C unless otherwise noted)							
Symbol	Parameter	Value	Unit					
V_{DSS}	Drain-Source Voltage	900	V					
V_{GS}	Gate-Source Voltage	±30	V					
T	Drain Current -Continuous (TC=25°C)	9	A					
I _D	Drain Current -Continuous (TC=100°C)	5.7	A					
I_{DM}	Drain Current Pulsed	36	A					
Eas	Single Pulsed Avalanche Energy	900	mJ					
Ear	Repetitive Avalanche Energy	28	mJ					
dV/dt	Peak Diode Recovery dV/dt	4	V/ns					
D	Power Dissipation (TC = 25 °C)	280	W					
P_D	- Derate above 25°C	2.22	W/°C					
T _J ,T _{STG}	Operating and Storage Temperature Range	-55 to +150	°C					
$T_{\rm L}$	Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	300	°C					

•Drain current limited by maximum junction temperature

Thermal Resistance Characteristics						
Symbol	Parameter	Max.	Units			
$R_{\theta J}c$	Junction-to-Case	0.45	0C/W			
RөлА	Junction-to-Ambient	40	°C/W			

On Characteristics						
Symbol	Test Conditions	Min	Typ.	Max.	Units	
$ m V_{GS}$	$V_{\rm DS} = V_{\rm GS} \; , \; I_{\rm D} = 250 \mu A \label{eq:VDS}$	3.0		5.0	V	
*R _{DS(ON)}	$V_{GS} = 10 \text{ V}, I_D = 4.5 \text{ A}$		1.05	1.4	Ω	

Off Characteristics						
Symbol	Test Conditions	Min	Typ.	Max.	Units	
BV_{DSS}	$V_{\rm GS}=0~V$, $I_{\rm D}\text{=}250\mu\text{A}$	900			V	
$\Delta BV_{DSS}/\Delta T_{J}$	$I_D = 250 \mu A$, Referenced to $25^{\circ} C$		0.99		V/°C	
IDSS	$V_{DS} = 900 \; V \; , \; V_{GS} = 0 \; V \ V_{DS} = 720 \; V \; , \; V_{C} = 125 ^{\circ}C$			10 100	μA	
I_{GSSF}	$V_{GS} = 30 \text{ V}$, $V_{DS} = 0 \text{ V}$			100	nA	
I _{GSSR}	$V_{GS} = -30 \text{ V}$, $V_{DS} = 0 \text{ V}$			-100	nA	



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Switching Characteristics						
Symbol	Test Conditions	Min	Тур.	Max.	Units	
$t_{d(on)}$			50		ns	
$t_{\rm r}$	$V_{DS} = 450 \text{ V}, I_D = 9 \text{ A},$		120		ns	
$t_{d(off)}$	$R_G = 25 \Omega$		100		ns	
tf			80		ns	
Qg			45		nC	
Q_{gs}	$V_{DS} = 720 \text{ V}, I_{D} = 9 \text{ A},$ $V_{GS} = 10 \text{ V}$		14		nC	
Q_{gd}	VGS = 10 V		18		nC	

Dynamic Characteristics							
Symbol	Test Conditions	Min	Тур.	Max.	Units		
Ciss			2200		pF		
Coss	$V_{DS} = 25 \text{ V}, V_{GS} = 0 \text{ V},$ $F = 1.0 \text{MHz}$		180		pF		
C _{RSS}	1' - 1.0WHZ		15		pF		

Source-Drain Diode Maximum Ratings and Characteristics							
Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units	
I_S					9		
Ism					36	A	
V_{SD}	$I_S = 9 A, V_{GS} = 0 V$				1.5	V	
t_{rr}	$I_S = 9 A$, $V_{GS} = 0 V$			550		ns	
Qrr	$diF/dt = 100A/\mu s$			6.5		μC	

Notes;

- 1. Repetitive Rating: Pulse width limited by maximum junction temperature
- 2. L= 21mH, Ias=9A, VdD=50V, RG=25 Ω , Starting TJ=25 $^{\circ}$ C
- 3. $I_{SD} \leq 9A$, $di/dt \leq 200A/\mu s$, $V_{DD} \leq BV_{DSS}$, $Starting T_J = 25$ °C
- 4. Pulse Test: Pulse Width $\leq 300 \,\mu\,\mathrm{s}$, Duty Cycle $\leq 2\%$
- 5. Essentially Independent of Operating Temperature



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