MSW11N90

900V N-Channel MOSFET

Description

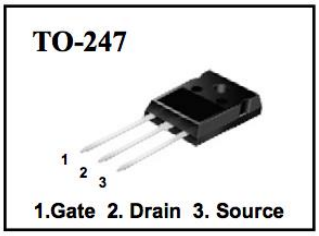
This latest technology has been especially designed to minimize on-state resistance, have a high rugged avalanche characteristics. These devices are well suited for high efficiency switch mode power supplies.

Features

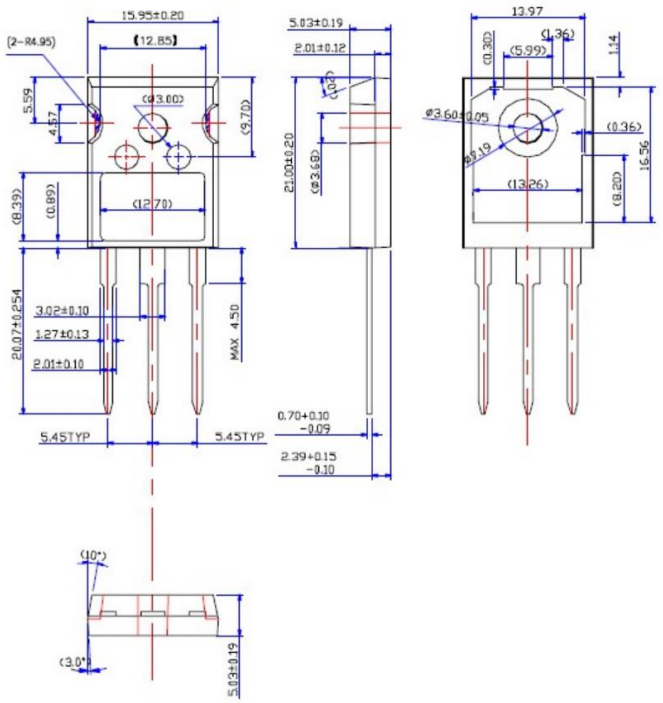
- RDS(on) (Max 1.1 Ω)@VGS=10V
- Gate Charge (Typical 70nC)
- Improved dv/dt Capability, High Ruggedness
- 100% Avalanche Tested
- Maximum Junction Temperature Range (150˚C)
- RoHS compliant package

Packing & Order Information

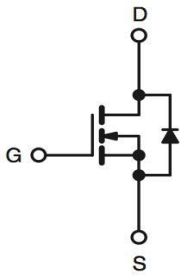
30/Tube ; 540/Box



RoHS COMPLIANT



Graphic symbol



MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

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
I_D	Drain Current -Continuous (TC=25°C)	11	A
	Drain Current -Continuous (TC=100°C)	6.6	A
I_{DM}	Drain Current Pulsed	44	A
E_{AS}	Single Pulsed Avalanche Energy	1280	mJ
E_{AR}	Repetitive Avalanche Energy	30	mJ
P_D	Power Dissipation (TC = 25 °C)	300	W
	- Derate above 25°C	2.38	W/°C
dV/dt	Peak Diode Recovery dV/dt	4	V/ns

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Absolute Maximum Ratings (Tc=25°C unless otherwise noted)			
Symbol	**Parameter**	**Value**	**Unit**
T_J,T_{STG}	Operating and Storage Temperature Range	-55 to +150	°C
T_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	0.42	°C/W
$R_{\theta JA}$	Junction-to-Ambient	40	

On Characteristics					
Symbol	**Test Conditions**	**Min**	**Typ.**	**Max.**	**Units**
V_{GS}	V_{DS} = V_{GS} , I_D = 250μA	3.0	--	5.0	V
*$R_{DS(ON)}$	V_{GS} = 10 V , I_D = 5.5 A	--	0.9	1.1	Ω

Off Characteristics					
Symbol	**Test Conditions**	**Min**	**Typ.**	**Max.**	**Units**
BV_{DSS}	V_{GS} = 0 V , I_D=250μA	900	--	--	V
$\Delta BV_{DSS}/\Delta T_J$	I_D = 250μA, Referenced to 25°C	--	1.0	--	V/°C
I_{DSS}	V_{DS} = 900 V , V_{GS} = 0 V V_{DS} = 720 V , V_C = 125°C	--	--	10 100	μA
I_{GSSF}	V_{GS} = 30 V , V_{DS} = 0 V	--	--	100	nA
I_{GSSR}	V_{GS} = -30 V , V_{DS} = 0 V	--	--	-100	nA

Switching Characteristics					
Symbol	**Test Conditions**	**Min**	**Typ.**	**Max.**	**Units**
$t_{d(on)}$	V_{DS} = 450 V, I_D = 11 A, R_G = 25 Ω	--	70	--	ns
t_r		--	150	--	ns
$t_{d(off)}$		--	150	--	ns
tf		--	90	--	ns
Q_g	V_{DS} = 720 V,I_D = 11 A, V_{GS} = 10 V	--	70	--	nC
Q_{gs}		--	15	--	nC
Q_{gd}		--	30	--	nC
C_{ISS}	V_{DS} = 25 V, V_{GS} = 0 V, F = 1.0MHz	--	3000	--	pF
C_{OSS}		--	250	--	pF
C_{RSS}		--	25	--	pF

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Source-Drain Diode Characteristics						
Symbol	**Parameter**	**Test Conditions**	**Min**	**Typ.**	**Max.**	**Units**
I_S			--	--	11	A
I_{SM}			--	--	44	
V_{SD}	I_S = 11 A , V_{GS} = 0 V		--	--	1.4	V
t_{rr}	I_S = 11 A , V_{GS} = 0 V		--	1200	--	ns
Q_{rr}	diF/dt = 100A/μs		--	20	--	μC

Notes;

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. L = 20mH, I_{AS}=11A, V_{DD}=50V, R_G=25Ω, Starting T_J=25℃
3. I_{SD}≦11A, di/dt≦200A/μs,V_{DD}≦BV_{DSS}, Starting T_J=25℃
4. Pulse Test: Pulse Width ≦ 300μs, Duty Cycle≦ 2%
5. Essentially Independent of Operating Temperature

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■Typical Characteristics

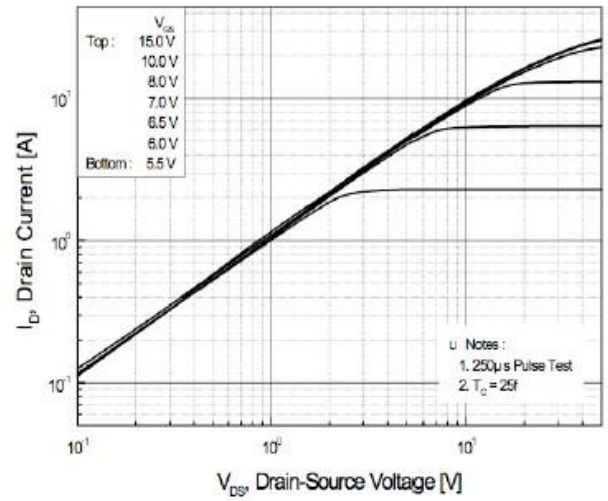

FIG.1-ON REGION CHARACTERISTICS

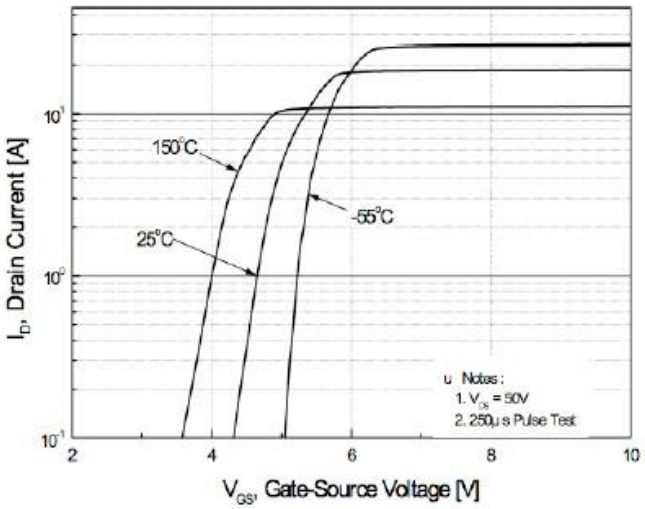

FIG.2-TRANSFER CHARACTERISTICS

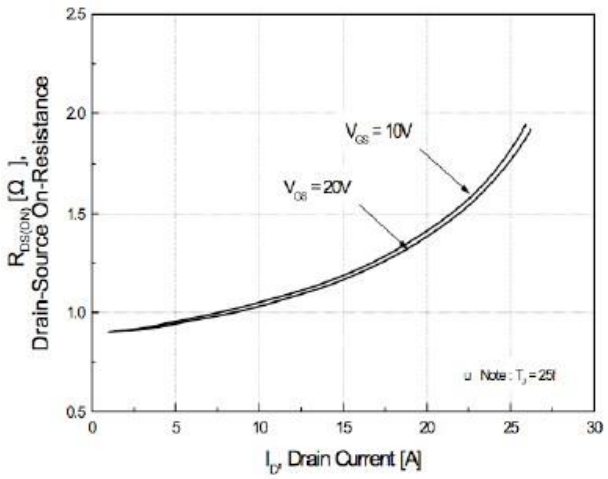

FIG.3-ON RESISTANCE VARIATION VS DRAIN CURRENT AND GATE VOLTAGE

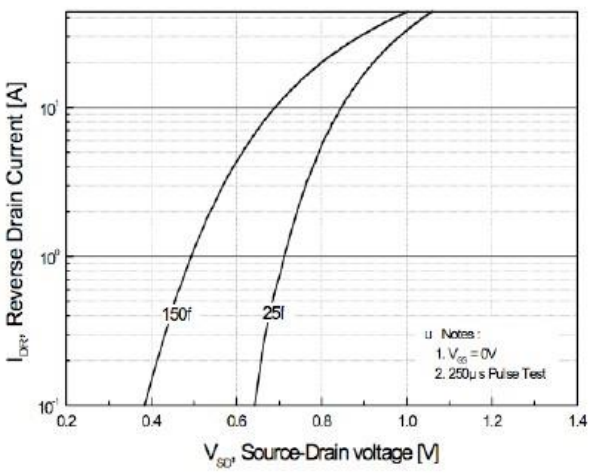

FIG.4-BODY DIODE FORWARD VOLTAGE VARIATION WITH SOURCE CURRENT AND TEMPERATURE

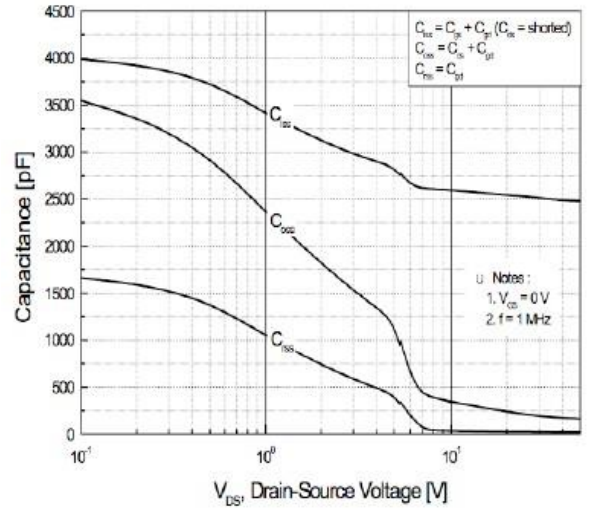

FIG.5-CAPACITANCE CHARACTERISTICS

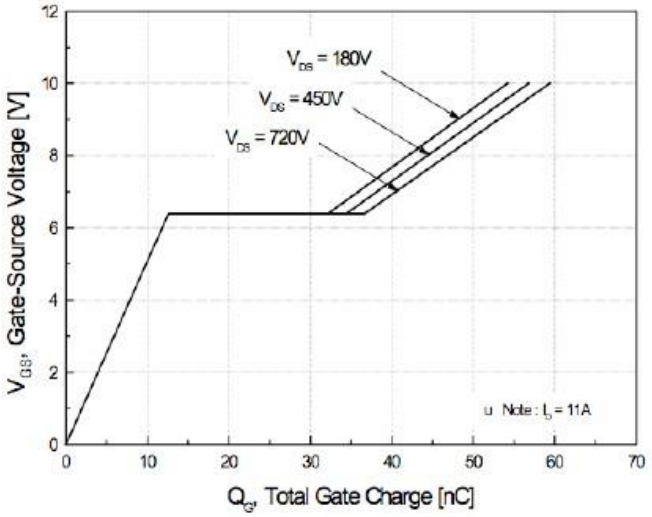

FIG.6-GATE CHARGE CHARACTERISTICS

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■Typical Characteristics

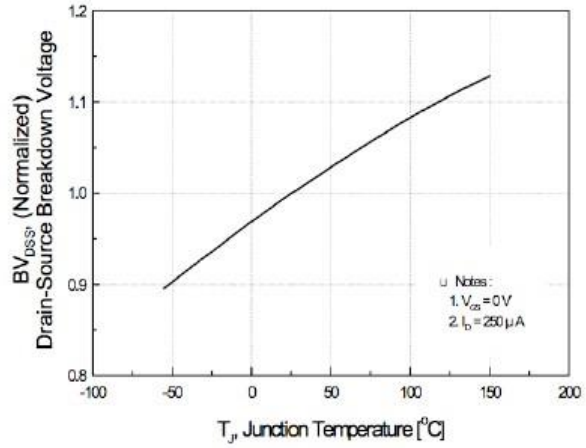

FIG.7-BREAKDOWN VOLTAGE VARIATION VS TEMPERATURE

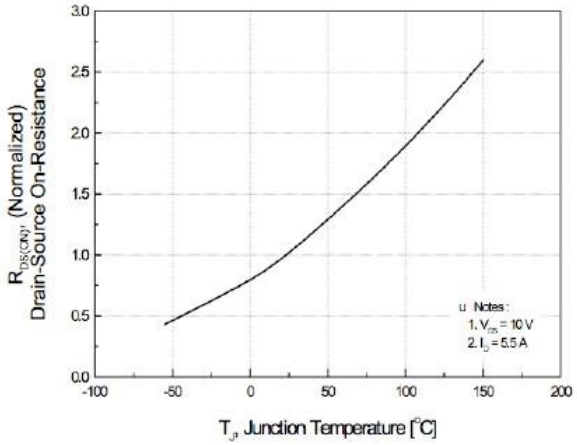

FIG.8-ON-RESISTANCE VARIATION VS TEMPERATURE

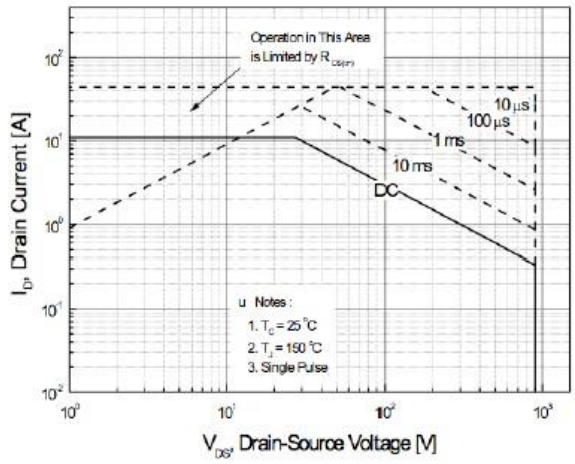

FIG.9-MAXIMUM SAFE OPERATING AREA

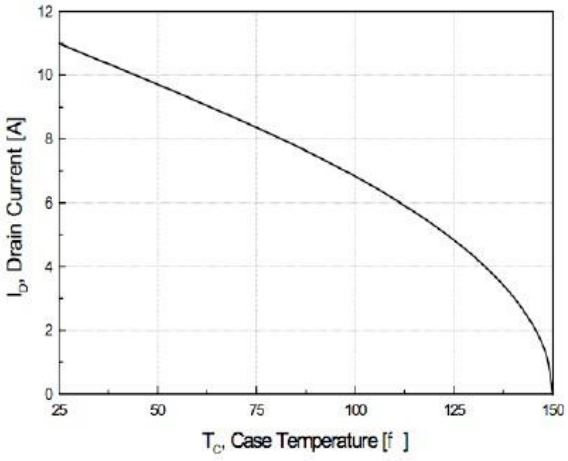

FIG.10-MAXIMUM DRAIN CURRENT VS CASE TEMPERATURE

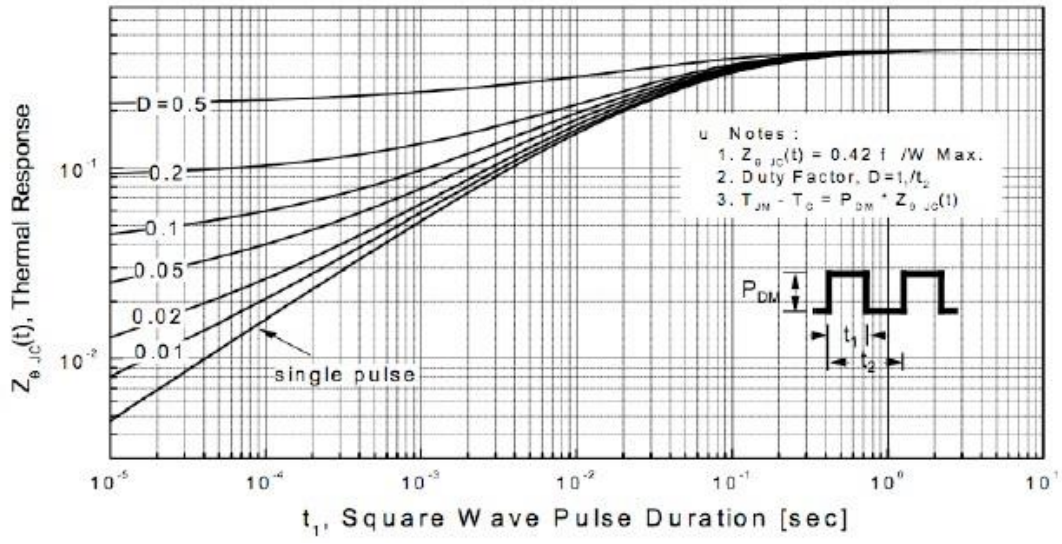

FIG.11-TRANSIENT THERMAL RESPONSE CURVE

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