



Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
900V	1.2Ω@10V	9A

Feature

- Low $R_{DS(ON)}$
- Low Gate Charge
- Low Gate Resistance
- 100% UIS Tested
- Improved dv/dt Capability
- 100% Avalanche Tested
- RoHS compliant

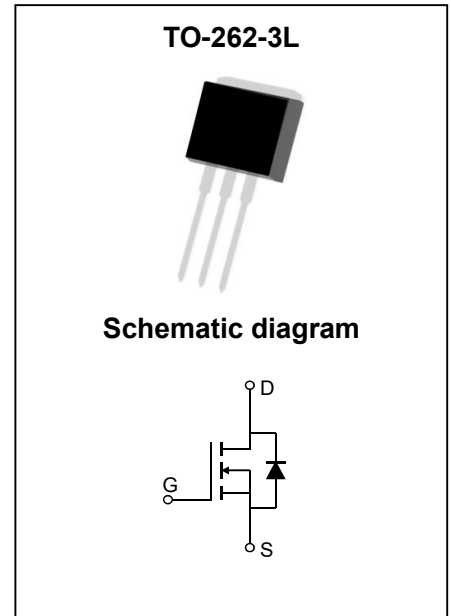
Application

- Power Switching Application
- PWM Motor Controls
- AC to DC Converters
- LED Lighting

MARKING:



09N90 = Device Code
XX = Date Code
Solid Dot = Green Indicator



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain - Source Voltage	V_{DS}	900	V
Gate - Source Voltage	V_{GS}	±30	V
Continuous Drain Current ¹	$T_C = 25^\circ\text{C}$	I_D	9 A
	$T_C = 100^\circ\text{C}$	I_D	5.6 A
Pulsed Drain Current ²	I_{DM}	36	A
Single Pulsed Avalanche Energy ³	I_{AS}	9	A
Single Pulsed Avalanche Energy ³	E_{AS}	486	mJ
Power Dissipation ⁵	$T_C = 25^\circ\text{C}$	P_D	25 W
Thermal Resistance from Junction to Ambient ⁶	$R_{\theta JA}$	69	$^\circ\text{C}/\text{W}$
Thermal Resistance from Junction to Case	$R_{\theta JC}$	5	$^\circ\text{C}/\text{W}$
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55~ +150	$^\circ\text{C}$

MOSFET ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$ unless otherwise noted)

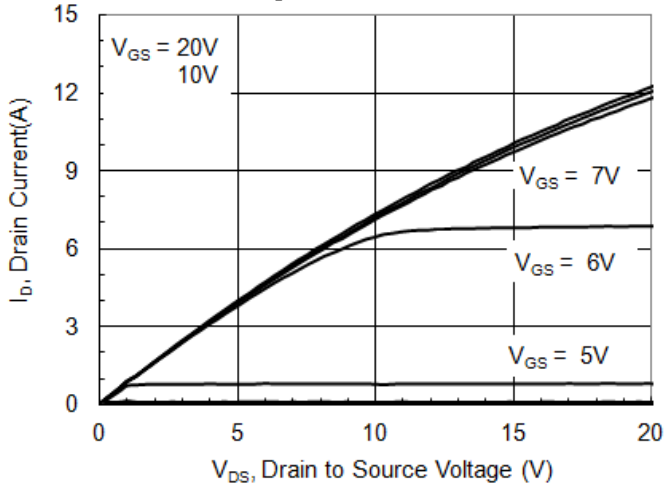
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Off Characteristics						
Drain - Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	900			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 900V, V_{GS} = 0V$			1	μA
Gate - Body Leakage Current	I_{GSS}	$V_{GS} = \pm 30V, V_{DS} = 0V$			± 100	nA
On Characteristics⁴						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	3	4	5	V
Drain-source On-resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 4.5A$		1.2	1.5	Ω
Forward Transconductance	g_{FS}	$V_{GS} = 10V, I_D = 4.5A$		7.2		S
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS} = 25V, V_{GS} = 0V, f = 1MHz$		2052		pF
Output Capacitance	C_{oss}			145		
Reverse Transfer Capacitance	C_{rss}			11		
Gate Resistance	R_g	$V_{DS} = 0V, V_{GS} = 0V, f = 1MHz$		2.3		Ω
Switching Characteristics						
Total Gate Charge	Q_g	$V_{DD} = 720V, V_{GS} = 10V, I_D = 9A$		42.2		nC
Gate-source Charge	Q_{gs}			13.3		
Gate-drain Charge	Q_{gd}			18.8		
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = 450V, V_{GS} = 10V, I_D = 9A, R_G = 25\Omega$		50		ns
Turn-on Rise Time	t_r			65		
Turn-off Delay Time	$t_{d(off)}$			86		
Turn-off Fall Time	t_f			34		
Source - Drain Diode Characteristics						
Diode Forward Voltage ⁴	V_{SD}	$V_{GS} = 0V, I_S = 9A$			1.3	V

Notes :

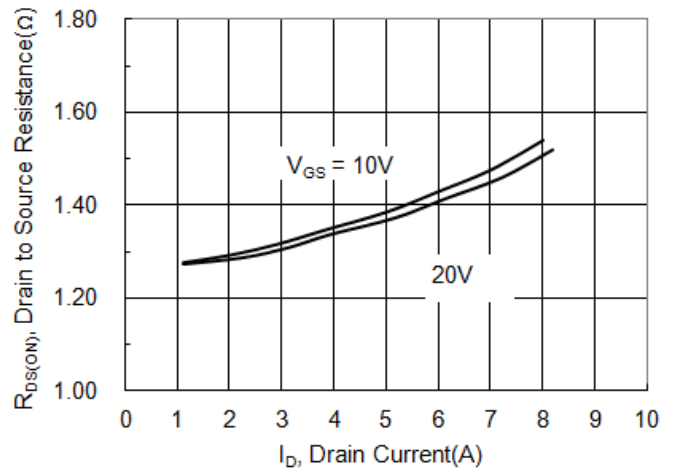
- 1.The maximum current rating is limited by package.And device mounted on a large heatsink
- 2.Pulse Test : Pulse Width $\leq 10\mu s$, duty cycle $\leq 1\%$.
- 3.EAS condition: $V_{DD} = 50V, V_{GS} = 10V, L = 12mH, R_G = 25\Omega$ Starting $T_J = 25^\circ\text{C}$.
- 4.Pulse Test : Pulse Width $\leq 300\mu s$, duty cycle $\leq 2\%$.
- 5.The power dissipation P_D is limited by $T_{J(MAX)} = 150^\circ\text{C}$.And device mounted on a large heatsink
- 6.Device mounted on $1in^2$ FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ\text{C}$.

Typical Characteristics

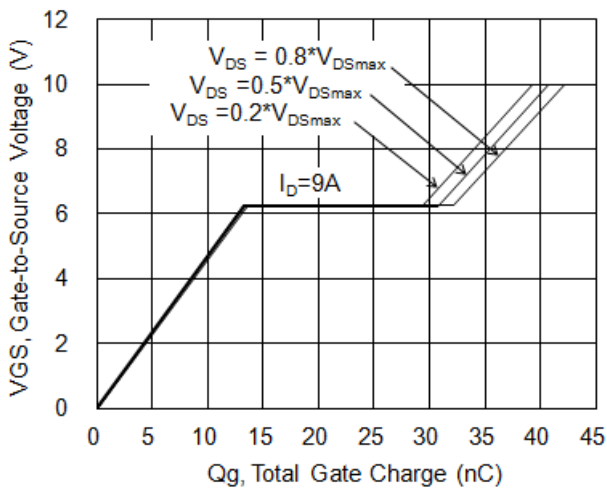
Output Characteristics



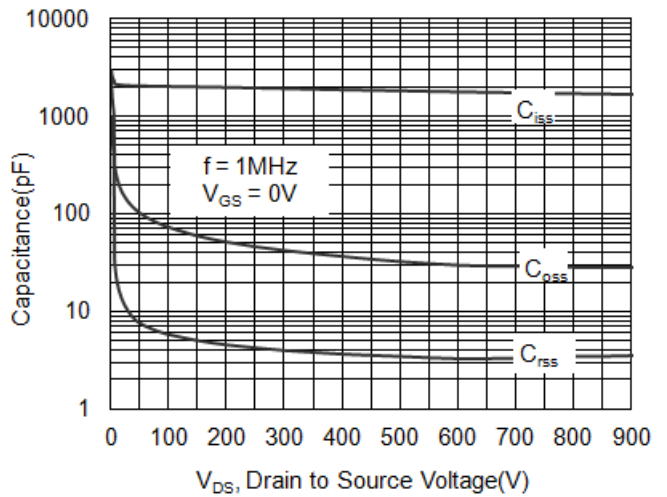
Drain-Source On-State Resistance



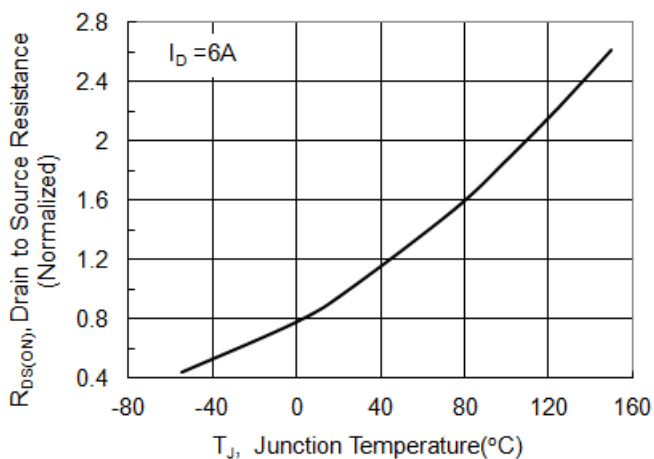
Gate Charge Characteristics



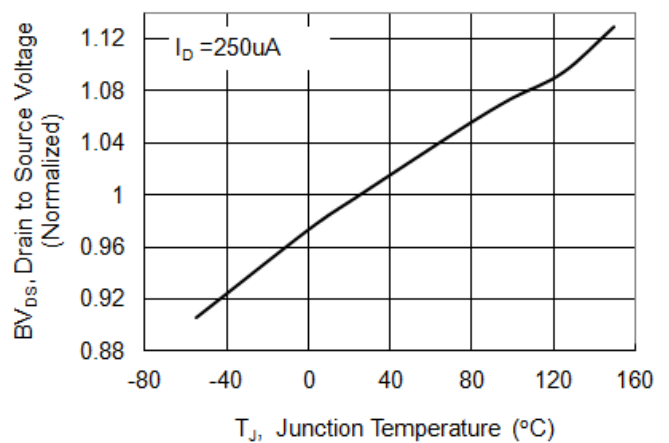
Capacitance Characteristics



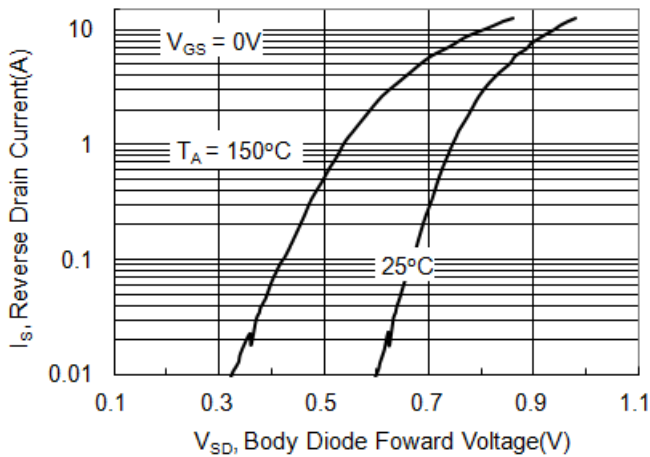
$R_{DS(ON)}$ vs Junction Temperature



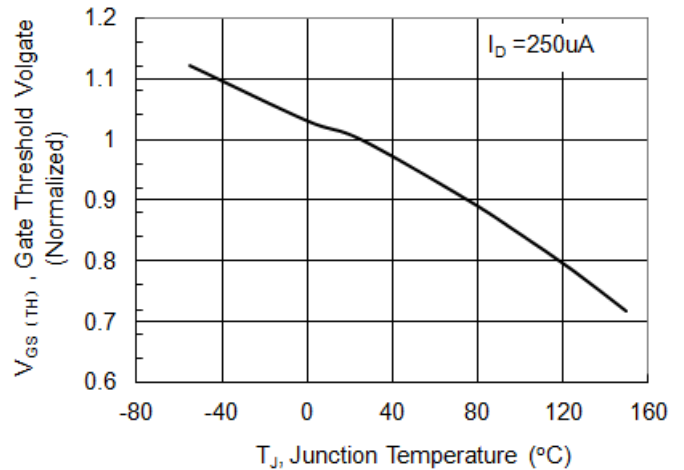
BV_{DSS} vs Junction Temperature



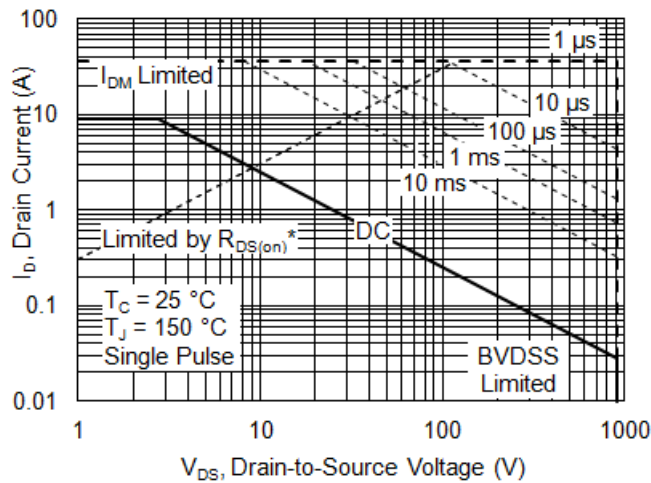
Forward Characteristics of Reverse Diode



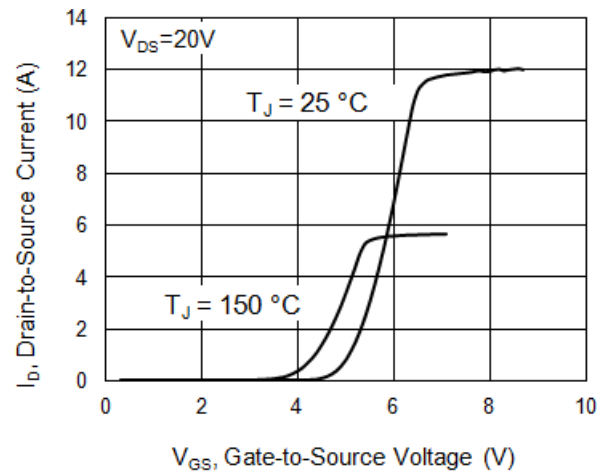
$V_{GS(TH)}$ vs Junction Temperature



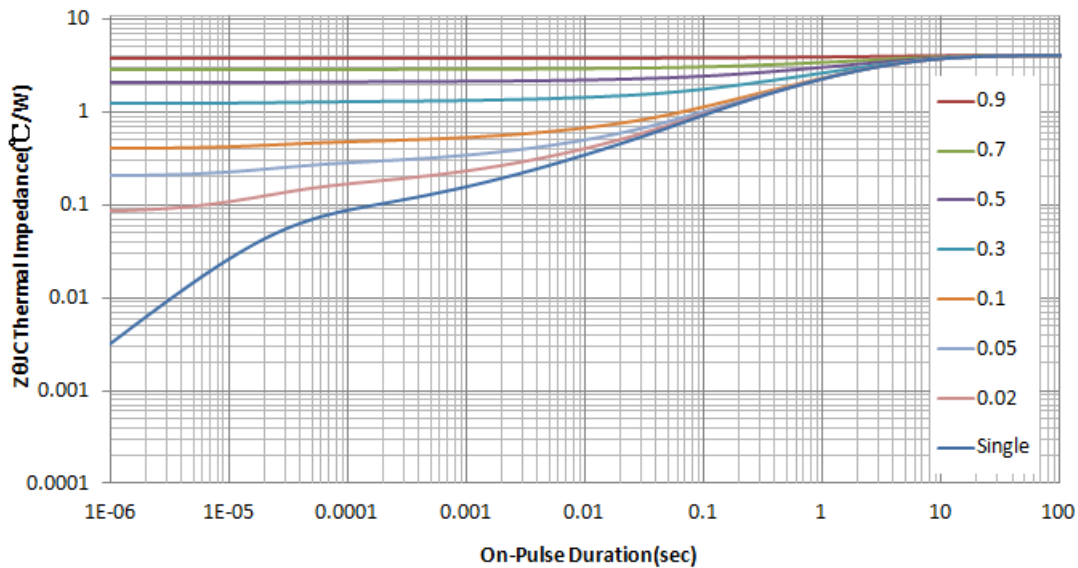
Safe Operating Area



Transfer Characteristics



Transient Thermal Impedance



TO-262-3L Package Information

