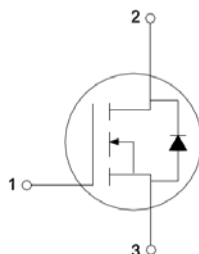


FEATURES

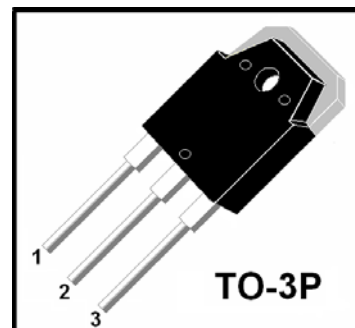
- Low drain-source ON resistance
- High forward transfer admittance
- Repetitive avalanche ratings
- Simple drive requirements
- Ease of paralleling

APPLICATIONS

- Switching power supplies
- Motor controls
- Inverters and choppers
- Audio amplifiers and energy pulse circuits



1.GATE
2.DRAIN
3.SOURCE



ABSOLUTE MAXIMUM RATINGS

$T_C=25^{\circ}\text{C}$ unless otherwise specified

Symbol	Parameter	Test Conditions	Values	Unit
V_{DSS}	Drain - Source Voltage	$T_J=25^{\circ}\text{C}$	900	V
V_{GSS}	Gate - Source Voltage		± 20	V
I_D	Continuous Drain Current	$T_C=25^{\circ}\text{C}$	12	A
		$T_C=100^{\circ}\text{C}$	9	A
I_{DM}	Pulsed Drain Current	Limited by T_{jmax}	36	A
P_D	Maximum Power Dissipation		140	W
E_{AS}	Single Pulse Avalanche Energy		650	mJ
I_{AR}	Avalanche Current		12	A
E_{AR}	Repetitive Avalanche Energy		20	mJ
T_J	Operating Junction		150	$^{\circ}\text{C}$
T_{STG}	Storage Temperature Range		-55~150	$^{\circ}\text{C}$
Weight			12	g

THERMAL CHARACTERISTICS

$T_C=25^{\circ}\text{C}$ unless otherwise specified

Symbol	Parameter	Test Conditions	Values	Unit
$R_{th(ch-c)}$	Thermal resistance,channel to case		0.9	$^{\circ}\text{C}/\text{W}$
$R_{th(ch-a)}$	Thermal resistance,channel to ambient		40	$^{\circ}\text{C}/\text{W}$

MM9N090P

ELECTRICAL CHARACTERISTICS

$T_C=25^\circ\text{C}$ unless otherwise specified

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	900			V
$R_{DS(ON)}$	Drain-Source ON Resistance	$V_{GS}=10V, I_D=4A$		0.85		Ω
		$V_{GS}=10V, I_D=9A$		0.95		Ω
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	2.5	3.5	4.5	V
I_{GSS}	Gate Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$	-200		200	nA
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=900V, V_{GS}=0V$			100	μA
Q_g	Total Gate Charge	$V_{DD}=400V, I_D=9A, V_{GS}=10V$		93		nC
Q_{gs}	Gate-Source Charge			28		nC
Q_{gd}	Gate-Drain Charge			30		nC
g_{fs}	Forward Transconductance	$V_{DS}=50V, I_D=4A$		8		S
C_{iss}	Input Capacitance	$V_{DS}=25V, V_{GS}=0V, f=1\text{MHz}$		3900		pF
C_{oss}	Output Capacitance			780		pF
C_{rss}	Reverse Transfer Capacitance			210		pF
$t_{d(on)}$	Turn - on Delay Time	$V_{DD}=400V, I_D=9A,$ $R_G=10\Omega,$ $V_{GS}=10V,$ $R_L=44\Omega$	$T_j=25^\circ\text{C}$	36		ns
			$T_j=125^\circ\text{C}$	36		ns
t_r	Rise Time		$T_j=25^\circ\text{C}$	30		ns
			$T_j=125^\circ\text{C}$	33		ns
$t_{d(off)}$	Turn - off Delay Time		$T_j=25^\circ\text{C}$	97		ns
			$T_j=125^\circ\text{C}$	102		ns
t_f	Fall Time		$T_j=25^\circ\text{C}$	32		ns
			$T_j=125^\circ\text{C}$	40		ns

Source-Drain RATINGS AND CHARACTERISTICS

$T_C=25^\circ\text{C}$ unless otherwise specified

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{SD}	Continuous Source-Drain Current				9	A
I_{SDM}	Pulse Source-Drain Current				36	A
V_{SD}	Source-Drain Voltage	$I_{SD}=9A, V_{GS}=0V, T_j=25^\circ\text{C}$		0.82	1.6	V
t_{rr}	Reverse Recovery Time	$I_{SD}=9A, di_{SD}/dt=-100A/\mu s$ $T_j=25^\circ\text{C}$		850		ns
I_{RRM}	Max. Reverse Recovery Current			20		A
Q_{RRM}	Max. Reverse Recovery Charge			9.3		μC

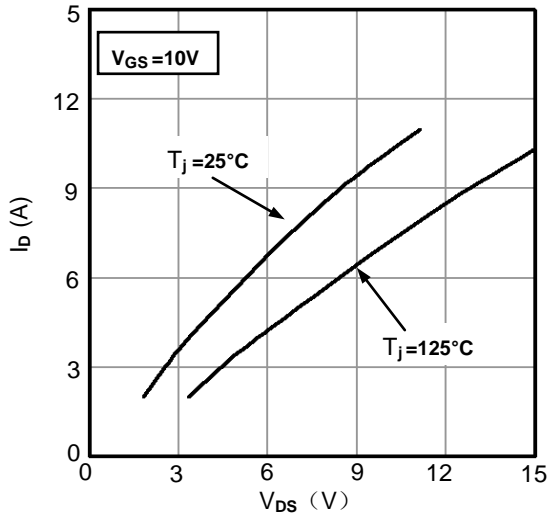


Figure1. Typical Output Characteristics

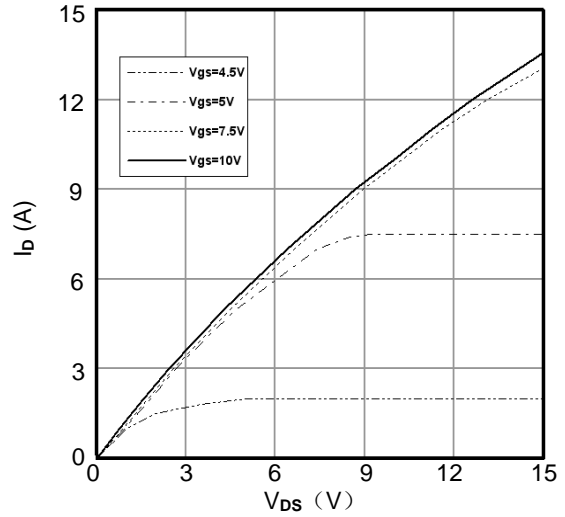


Figure2. Typical Output Characteristics

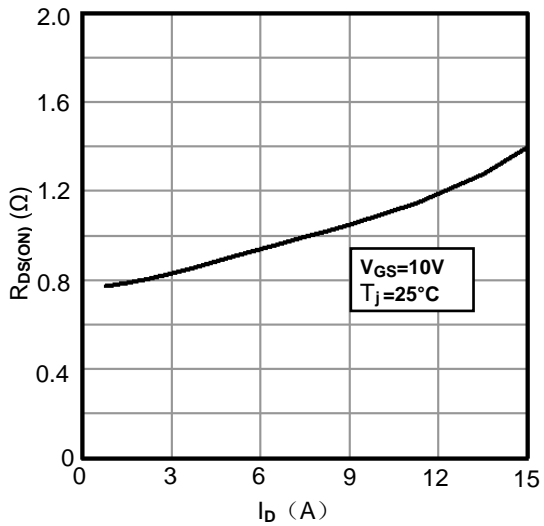


Figure3. Drain-Source ON Resistance vs. I_D

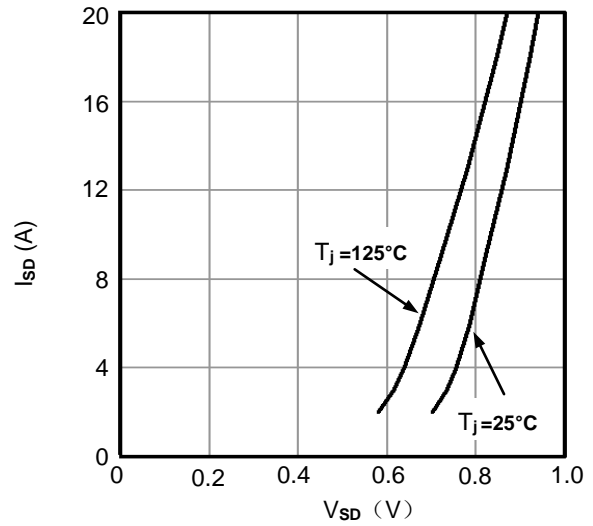


Figure4. Source-Drain Voltage

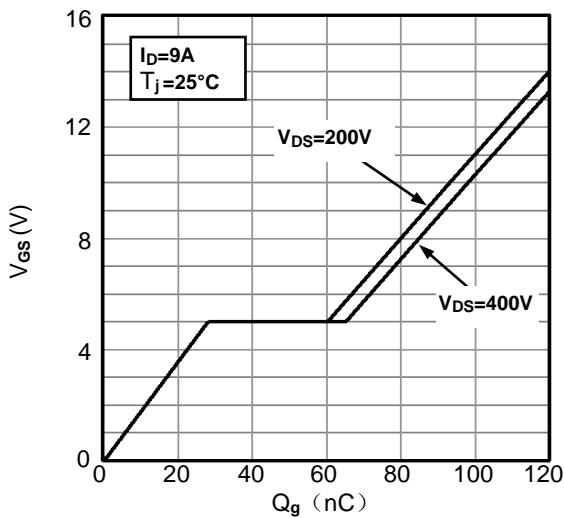


Figure5. Gate Charge characteristics

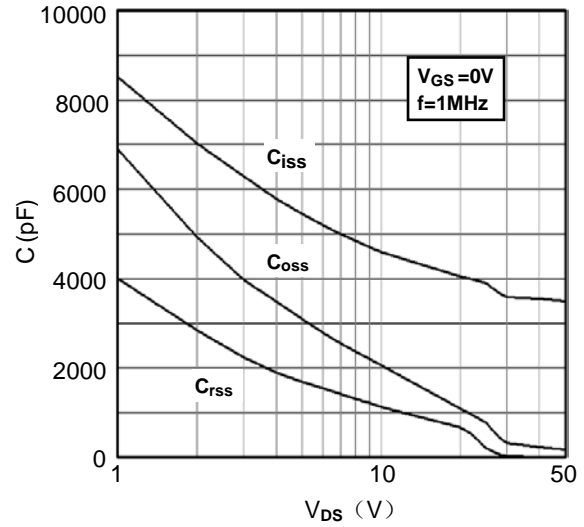


Figure6. Typical Capacitances vs. V_{DS}

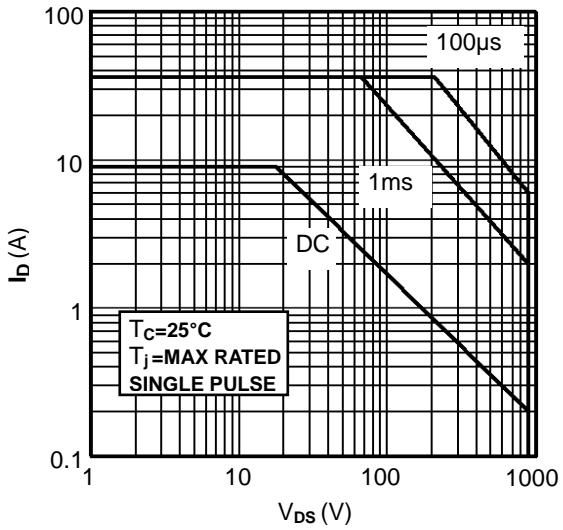


Figure 7. Forward Bias Safe Operating Area

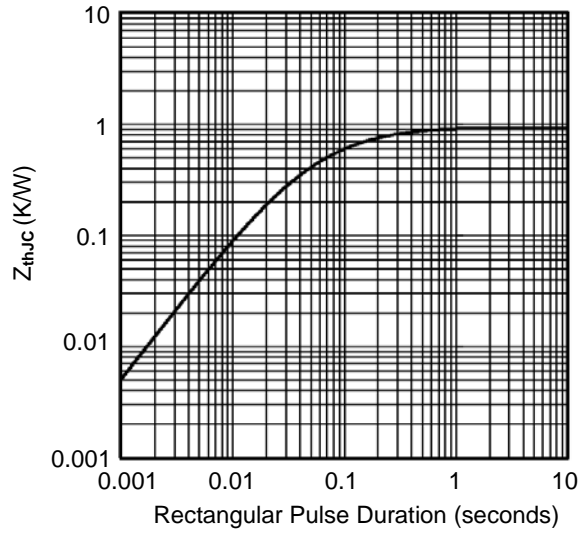


Figure 8. Transient Thermal Impedance

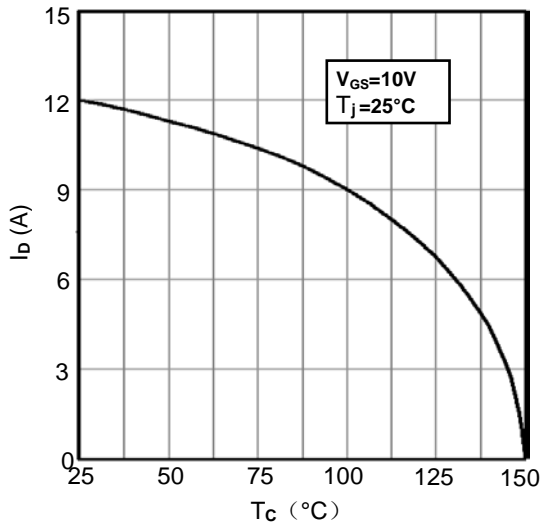


Figure 9. Maximum Continuous Drain Current vs. Case Temperature

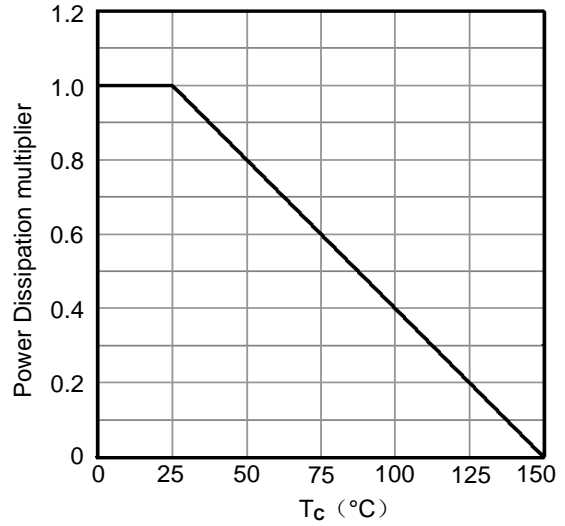


Figure 10. Normalized Power Dissipation vs. Case Temperature

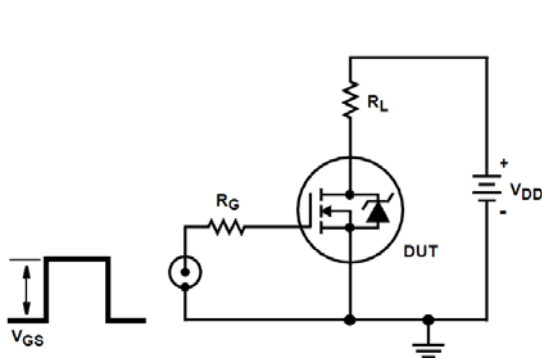


Figure 11. Switching Time Test Circuit

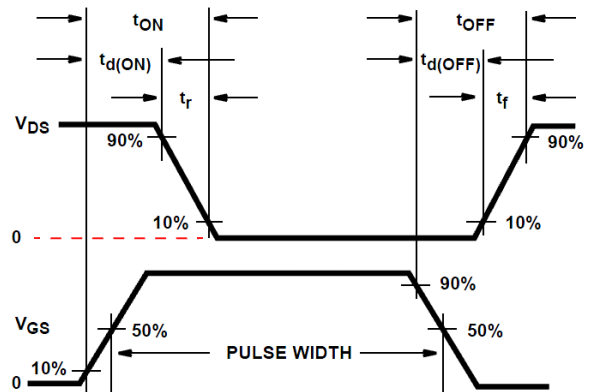


Figure 12. Resistive Switching Waveforms

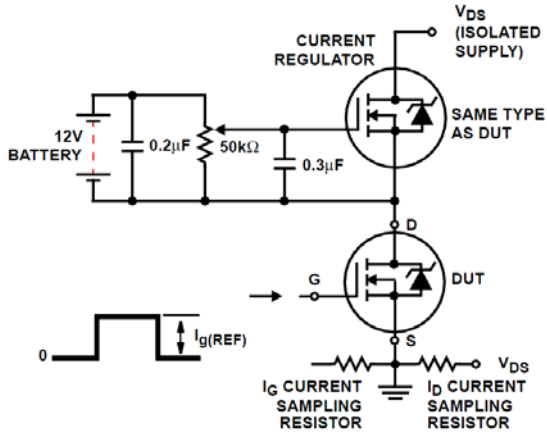


Figure13. Gate Charge Test Circuit

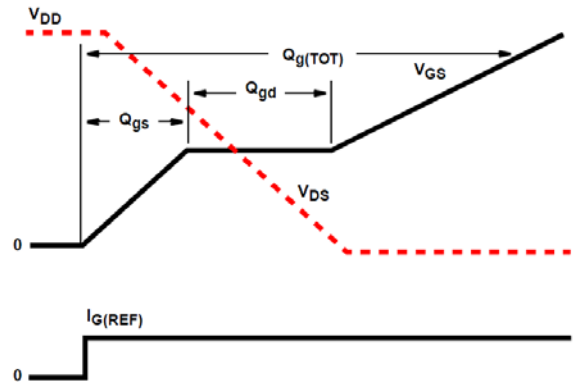
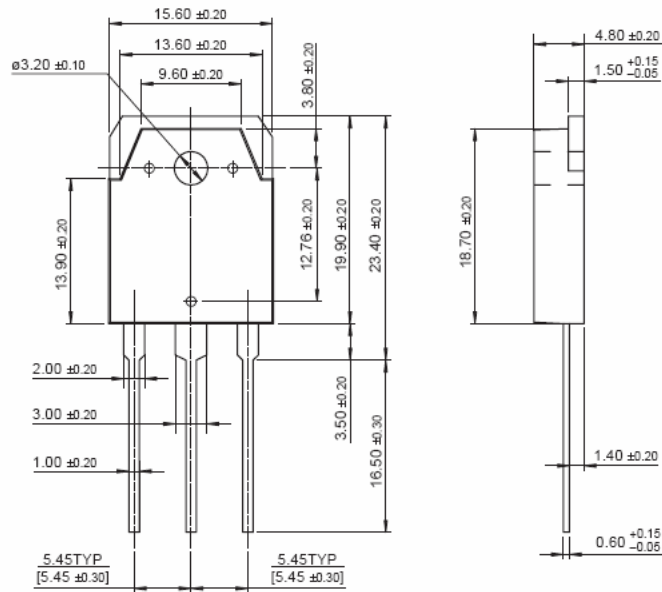


Figure14. Gate Charge Waveforms



Dimensions (mm)
Figure15. Package Outline