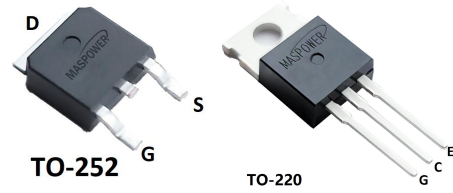


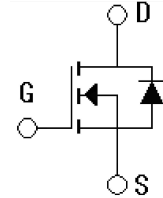
Features

- Ultra-low gate charge
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability
- RoHS product



Applications

- High frequency switching mode power supply
- Electronic ballast
- UPS



Absolute Ratings (Tc=25°C)

Parameter	Symbol		Value	Unit
Drain-Source Voltage	V _{DSS}		900	V
Transient Gate-Source Voltage	V _{GSM}		±30	V
Continuous Gate-Source Voltage	V _{GSS}		±20	V
Drain Current-continuous	I _D	T _C =25℃	8	A
		T _C =100℃	5	A
Drain Current-pulse (note 1)	I _{DM}		32	A
Avalanche Current(note 1)	I _{AR}		2.7	A
Single pulse avalanche energy (note 2)	E _{AS}		122	mJ
Power Dissipation TO-252	PD TC=25℃ Derate above 25℃		104	W
			0.83	W/℃
Power Dissipation TO-220	PD TC=25℃ Derate above 25℃		178	W
			1.42	W/℃
Peak Diode Recovery dv/dt (note 3)	dv/dt		15	V/ns
MOSFET dv/dt ruggedness(not 4)	dv/dt		50	
Operating and Storage Temperature Range	T _J ,T _{STG}		-55~+150	℃
Maximum Lead Temperature for Soldering Purposes	T _L		300	℃

Electrical Characteristics($T_{CASE}=25^{\circ}C$ unless otherwise specified)

Parameter	Symbol	Tests conditions	Min	Type	Max	Units
Drain-Source Voltage	BV_{DSS}	$I_D=250\mu A, V_{GS}=0V$	900	-	-	V
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	$I_D=250\mu A$, referenced to $25^{\circ}C$	-	1.05	-	V/ $^{\circ}C$
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=900V, V_{GS}=0V,$ $T_C=25^{\circ}C$	-	-	1	μA
		$V_{DS}=900V, T_C=125^{\circ}C$	-	-	50	μA
Gate body leakage current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$	-	-	± 100	nA

On-Characteristics

Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.5	-	4.5	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=4A$	-	0.70	0.90	Ω
Forward Trans-conductance	g_{FS}	$V_{DS}=40V, I_D=4A$ (note 5)	-	5.6	-	S

Dynamic Characteristics

Input capacitance	C_{iss}	$V_{DS}=25V, V_{GS}=0V,$ $f=1.0MHz$	-	687	-	pF
Output capacitance	C_{oss}		-	67	-	pF
Reverse transfer capacitance	C_{rss}		-	12	-	pF

Electrical Characteristics($T_{CASE}=25^{\circ}C$ unless otherwise specified)

Parameter	Symbol	Tests conditions	Min	Type	Max	Units
Switching-Characteristics						
Turn-On delay time	$t_{d(on)}$	$V_{DD}=450V, I_D=4A,$ $R_{GEN}=25\Omega$ (note 5,6)	-	32	-	ns
Turn-On rise time	t_r		-	20	-	ns
Turn-Off delay time	$t_{d(Off)}$		-	52	-	ns
Turn-Off rise time	t_f		-	14	-	ns
Total Gate Charge	Q_g	$V_{DS}=720V, I_D=4A,$ $V_{GS}=10V$ (note 5,6)	-	18.4	-	nC
Gate-Source charge	Q_{gs}		-	6.2	-	nC
Gate-Drain charge	Q_{gd}		-	4.5	-	nC

Drain-Source Diode Characteristics and Maximum Ratings						
Diode Forward Voltage (note 3)	V_{SD}	$V_{GS}=0V, I_S=8A$	-	-	1.3	V
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}	-	-	-	32	A
Maximum Continuous Drain Source Diode Forward Current	I_S	-	-	-	8	A
Reverse recovery time	t_{rr}	$V_{GS}=0V, V_{DD}=60V$	-	254	-	ns
Reverse recovery charge	Q_{rr}	$I_S=4A, di_F/dt=100A/\mu s$ $T_c=25^\circ C$ (note 5)	-	1260	-	nC
Reverse recovery time	t_{rr}	$V_{GS}=0V,$ $I_S=3A, di_F/dt=100A/\mu s$	-	332	-	ns
Reverse recovery charge	Q_{rr}	$T_c=100^\circ C$ (note 5)	-	1530	-	nC

Thermal Characteristics

Parameter	Symbol	Value		Unit
		TO-252	TO-220	
Thermal Resistance, junction to Case	$R_{th(j-C)}$	1.2	0.7	$^\circ C/W$
Thermal Resistance, Junction to Ambient	$R_{th(j-A)}$	40	35	$^\circ C/W$

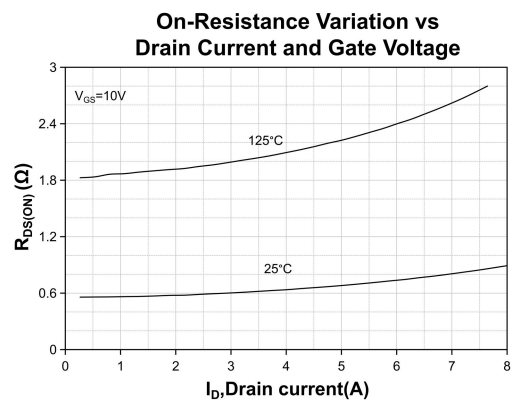
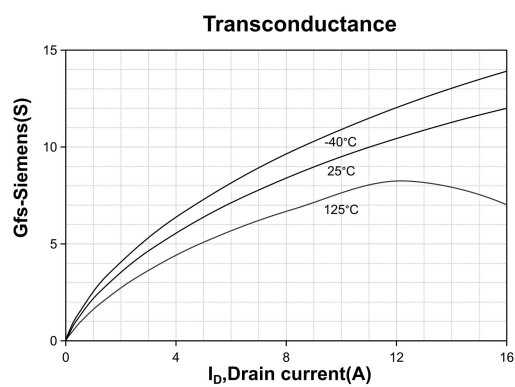
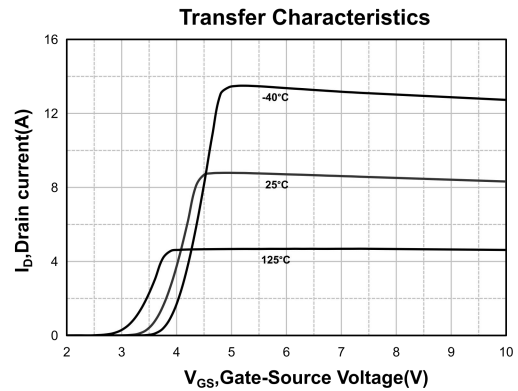
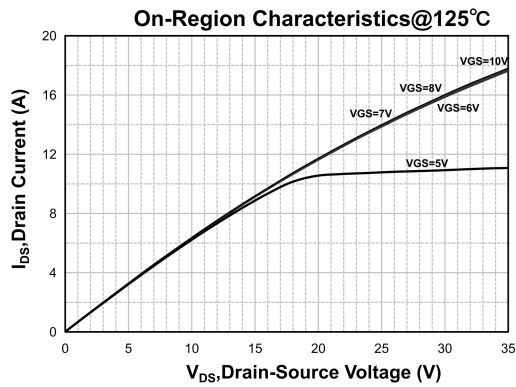
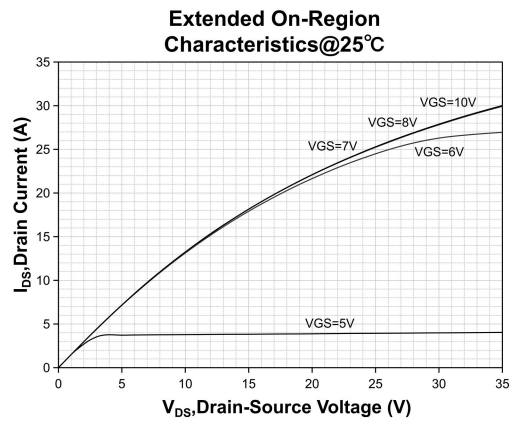
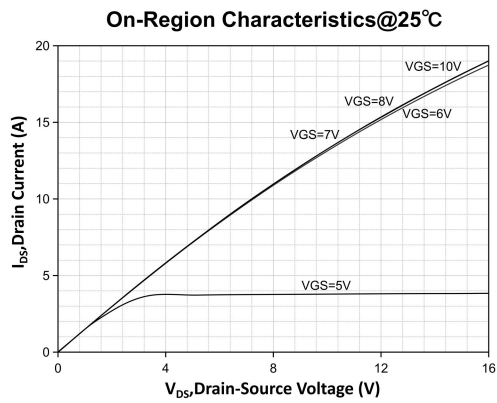
Order Message

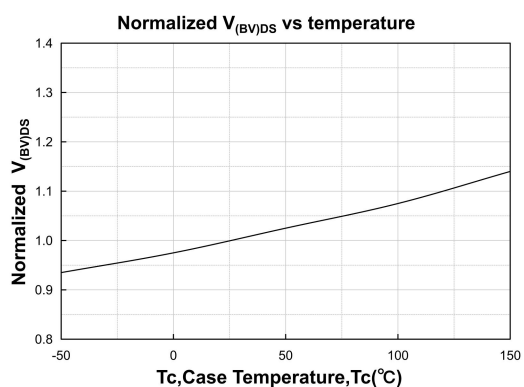
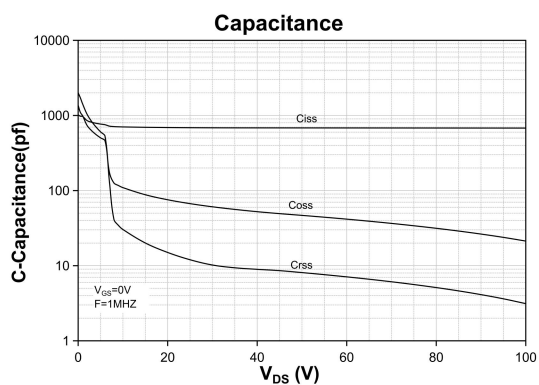
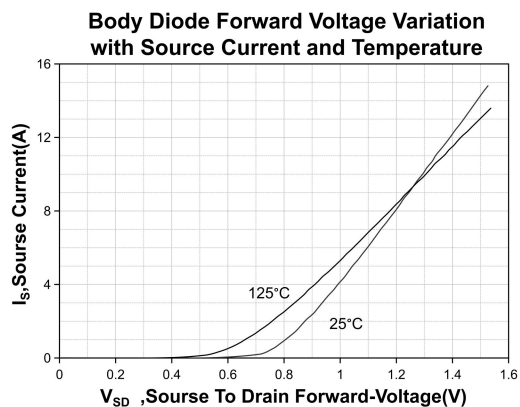
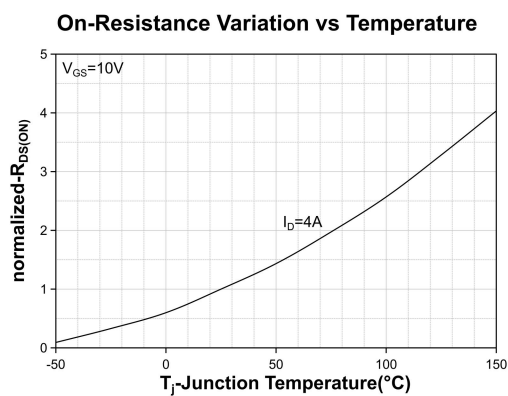
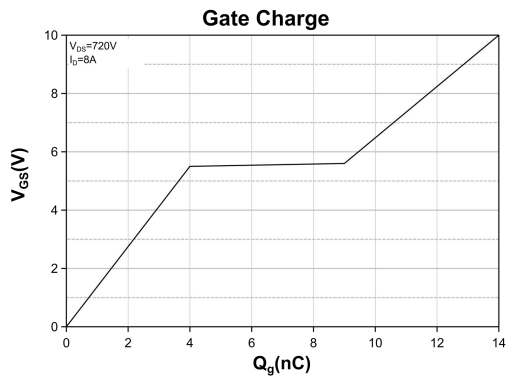
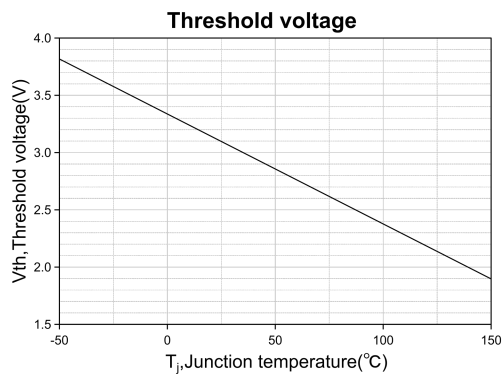
Marking	Package
MS8N90ICD0	TO-252
MS8N90ICT0	TO-220

Notes:

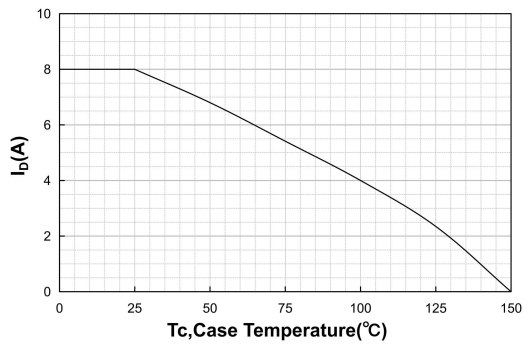
1. Pulse width limited by maximum junction temperature
2. $I_{AS}=I_{AR}$, $V_{DD}=50V$, $R_G=25\ \Omega$, Starting $T_J=25^\circ C$
3. $I_{SD} \leq 8A, di/dt \leq 200A/\mu s, V_{DD} \leq BV_{DSS}$, Starting $T_J=25^\circ C$
4. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$
5. Essentially independent of operating temperature

ELECTRICAL CHARACTERISTICS (curves)

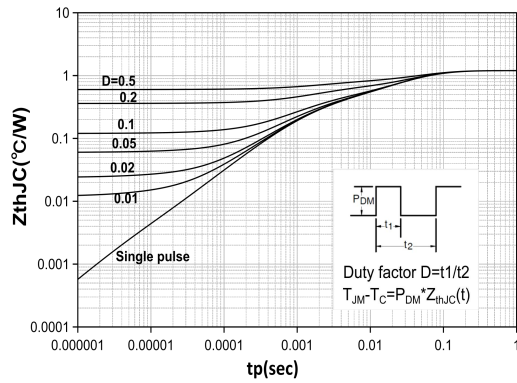




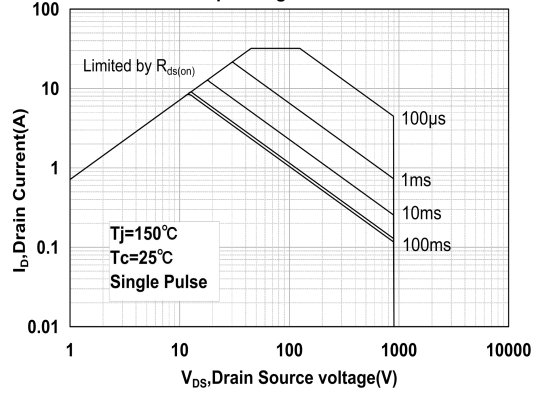
Maximum Drain Current vs Case Temperature



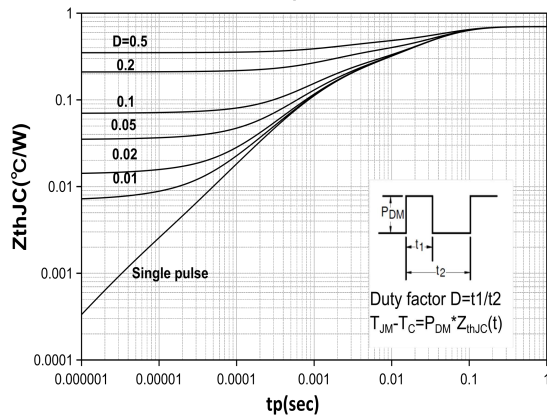
Transient Thermal Response Curve For TO-252



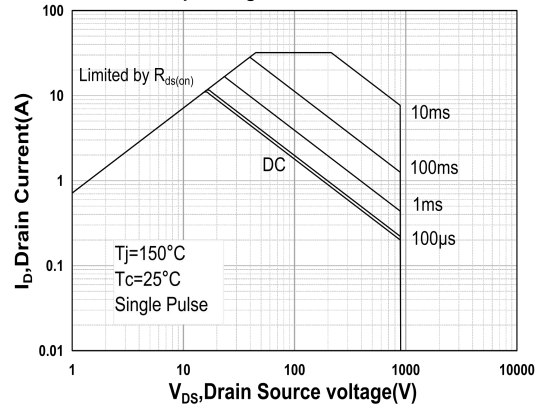
Safe Operating Area For TO-252



Transient Thermal Response Curve for TO-220



Safe Operating Area For TO-220



PACKAGE MECHANICAL DATA

