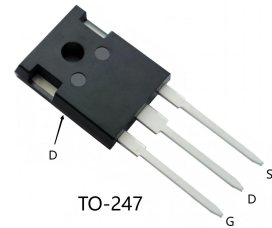


MS39N100ICC0

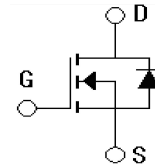
Features

- $V_{DS}=1000V, I_D=39A, R_{DS(on)}\leq 0.15\Omega$
- avalanche tested and current rated
- Fast intrinsic Rectifier



Applications

- High power density
- Easy to mount
- Space savings



Absolute Ratings ($T_c=25^\circ C$)

Parameter	Symbol		Limit	Unit
Drain-Source Voltage	V _{DSS}		1000	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℃	39	A
		T _C =100℃	20	
Drain Current-pulse(1)	I _{DM}		78	
Repetitive Avalanche current(1)	I _{AR}		13	A
Single Pulsed Avalanche Energy (2)	E _{AS}		1690	mJ
Maximum Power Dissipation	P _D		312	W
Operating and Storage Temperature Range	T _J ,T _{STG}		-55~+150	℃
Maximum lead temperature for soldering purposes	T _L		260	℃
Isolation Voltage Between Case to Thermal	V _{ISO}		2.5	kV

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

Parameter	Symbol	Tests conditions	Min	Typ	Max	Units
Drain-Source Voltage	BV_{DSS}	$I_D=0.25mA, V_{GS}=0V$	1000	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=V_{DSS}, V_{GS}=0V$	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
On-Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=0.25mA$	2.5	-	3.5	V

Static Drain-Source On-Resistance (3)	R _{DS(ON)}	V _{GS} =10V,I _D =10A	-	0.10	0.15	Ω
Forward Transconductance	g _{fs}	V _{DS} =10V,I _D =10A (note3)	-	28	-	S
Dynamic Characteristics						
Input capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1.0MHz	-	5280	-	pF
Output capacitance	C _{oss}		-	225	-	pF
Reverse transfer capacitance	C _{rss}		-	12	-	pF
Switching-Characteristics						
Turn-On delay time	t _{d(on)}	V _{DS} =500V,I _D =19A, R _g =25Ω (note3,4)	-	56	-	ns
Turn-On rise time	t _r		-	75	-	ns
Turn-Off delay time	t _{d(Off)}		-	254	-	ns
Turn-Off rise time	t _f		-	72	-	ns
Total Gate Charge	Q _g	V _{DS} =500V,I _D =19A, V _{GS} =10V (note3,4)	-	63	-	nC
Gate-Source charge	Q _{gs}		-	15	-	nC
Gate-Drain charge	Q _{gd}		-	22	-	nC
Drain-Source Diode Characteristics and Maximum Ratings						
Maximum Continuous Drain-Source Diode Forward Current	V _{SD}	V _{GS} =0V,I _S =1A	-	0.68	1.2	V
Diode Forward Current	I _S	TC=25℃	-	-	39	A
Reverse recovery time	T _{rr}	I _S =19A, -di/dt=100A/μs V _R =500V,V _{GS} =0V	-	0.34	-	us
Reverse Recovery Charge	Q _{rr}		-	3.2	-	uC

Thermal Characteristics

Parameter	Symbol	Max.	Unit
Thermal Resistance, junction to Case	$R_{th(j-C)}$	0.40	$^\circ C/W$
Case to Sink Thermal Resistance, junction-Ambient	$R_{th(C-A)}$	40	

Order Message

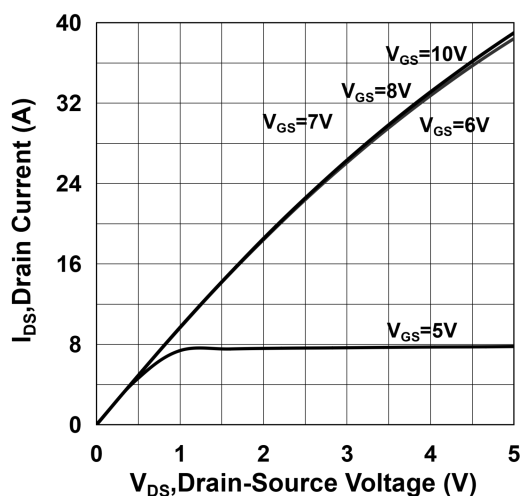
Marking	Package
MS39N100ICC0	TO-247

Notes:

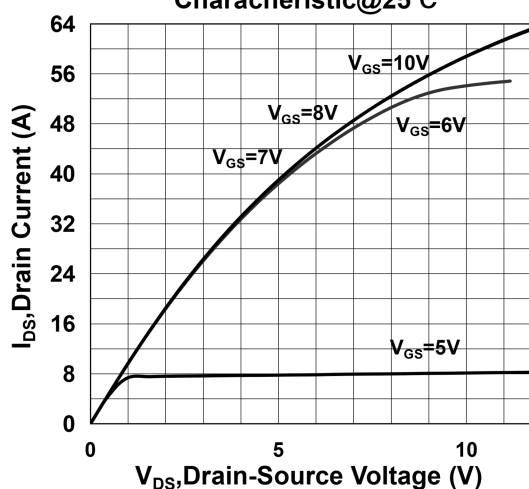
1. Repetitive Rating : Pulse width limited by maximum junction temperature
2. $L = 20\text{ mH}, I_{AS}=I_{AR}, V_{DD} = 50V, R_G = 25\ \Omega$, Starting $T_J = 25^\circ C$
3. Pulse Test : Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$
4. Essentially independent of operating temperature

Electrical Characteristics

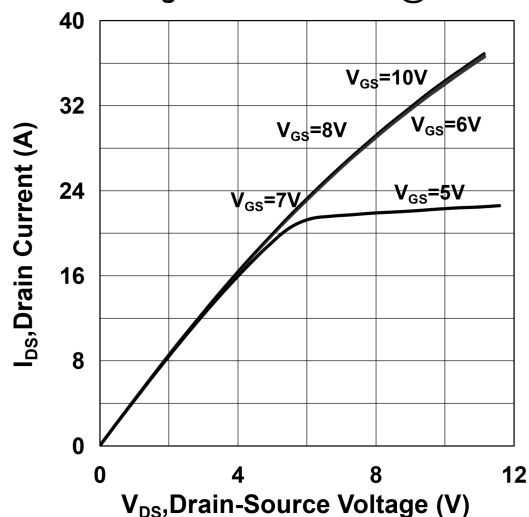
On-Region Characteristic@25°C



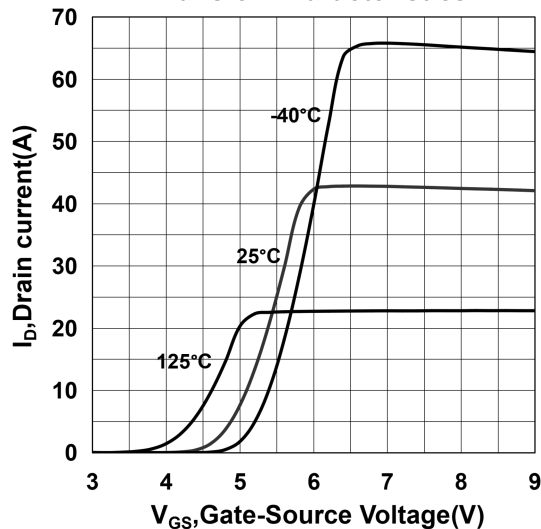
Extended On-Region Characteristic@25°C



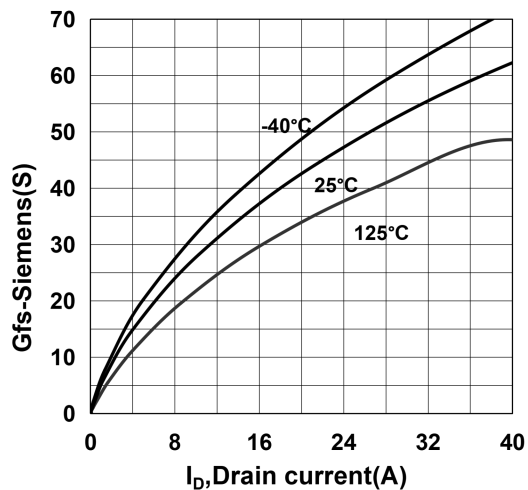
On-Region Characteristic@125°C



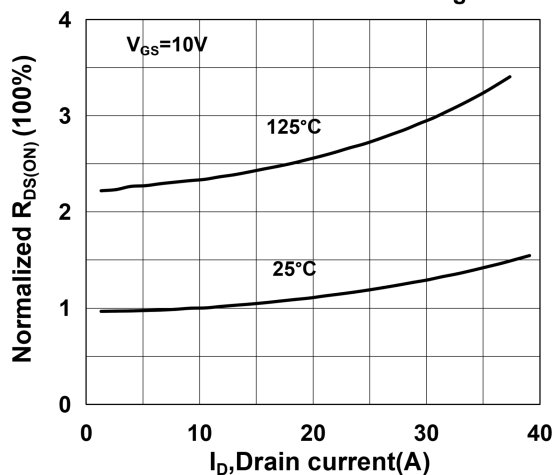
Transfer Characteristics



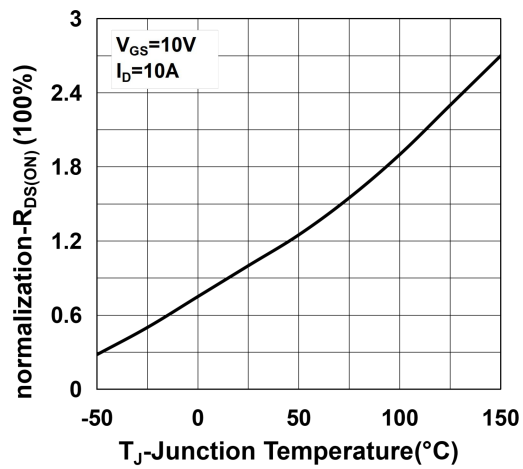
Transconductance



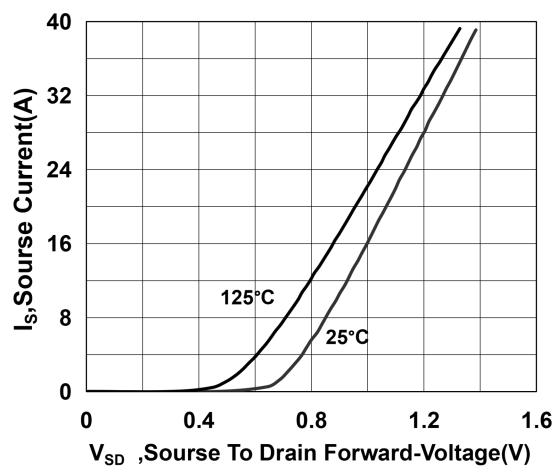
Normalized On-Resistance Variation vs Drain Current and Gate Voltage



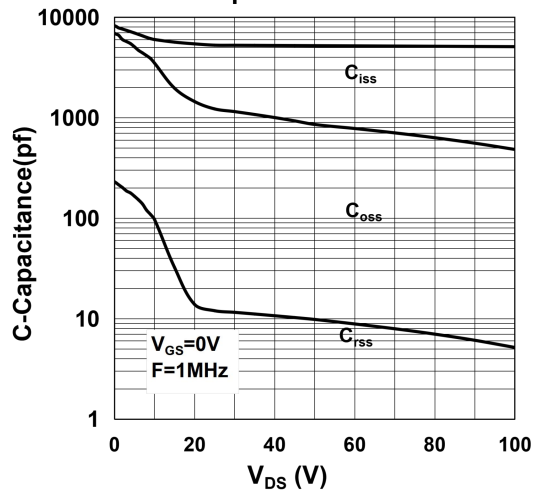
Normalization On-Resistance
Variation vs Junction Temperature



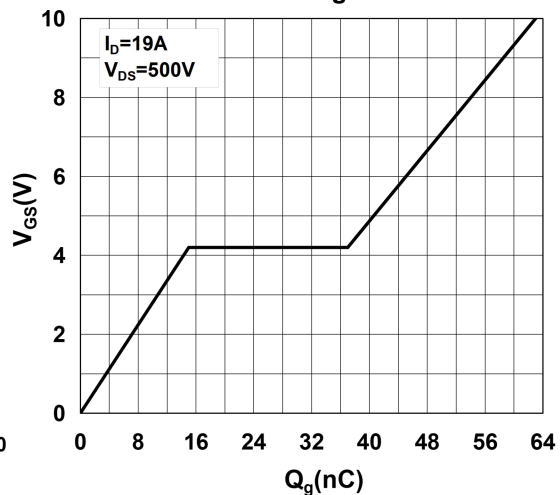
Body Diode Forward Voltage Variation
with Source Current and Temperature



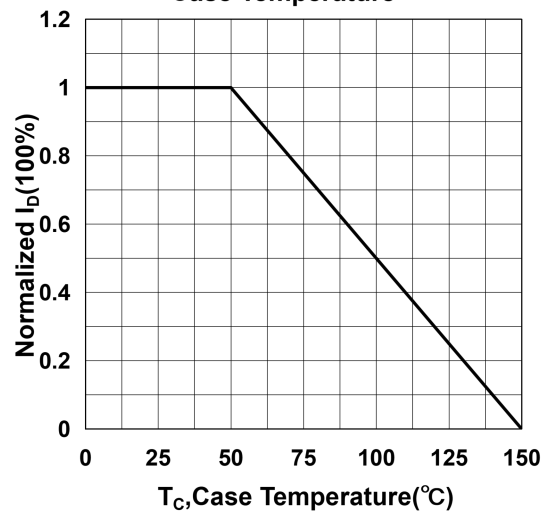
Capacitance



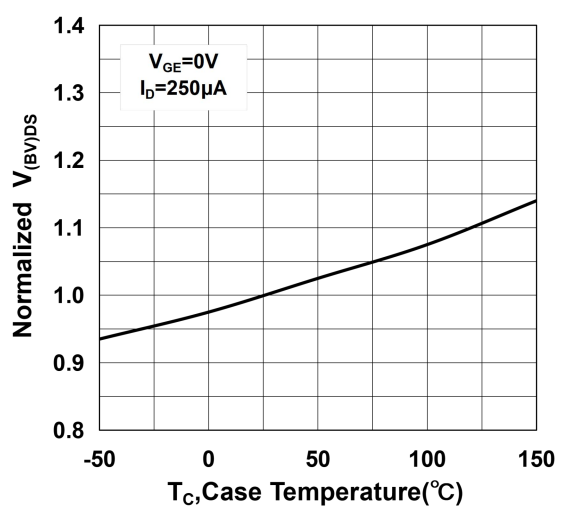
Gate Charge



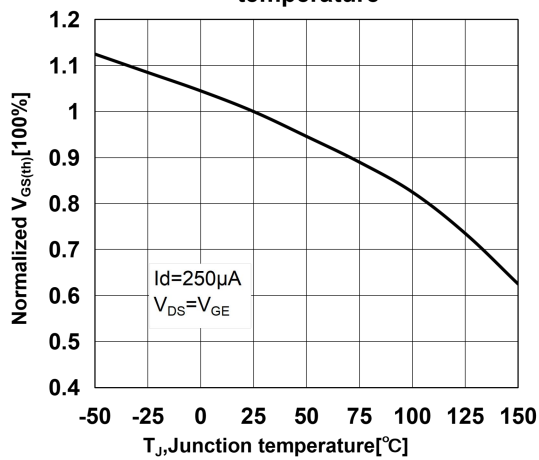
Maximum Drain Current vs
Case Temperature



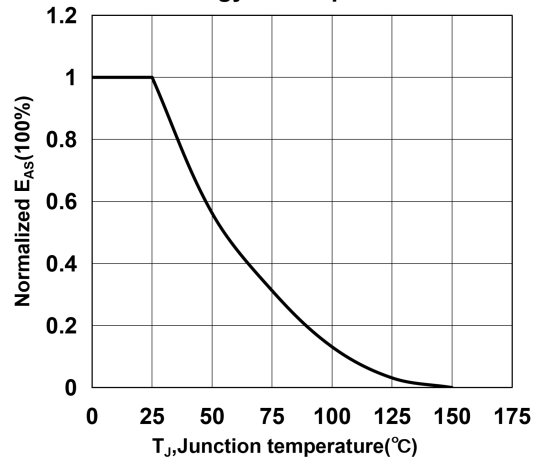
Normalized $V_{(BV)DS}$ vs temperature



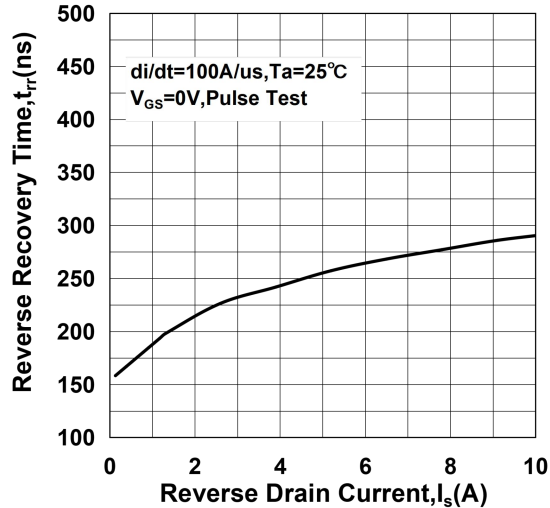
Normalized gate threshold voltage vs temperature



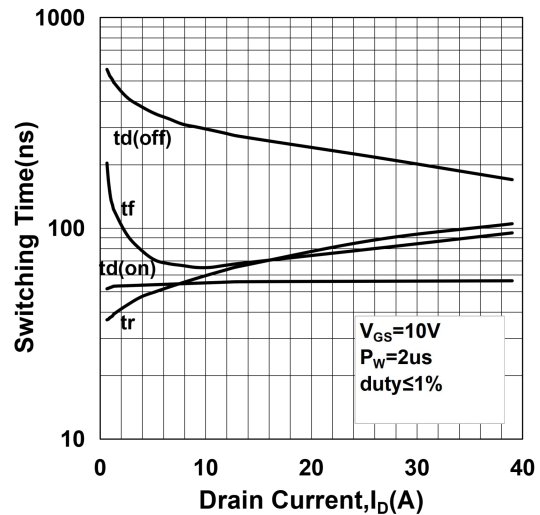
Normalized maximum avalanche energy vs temperature



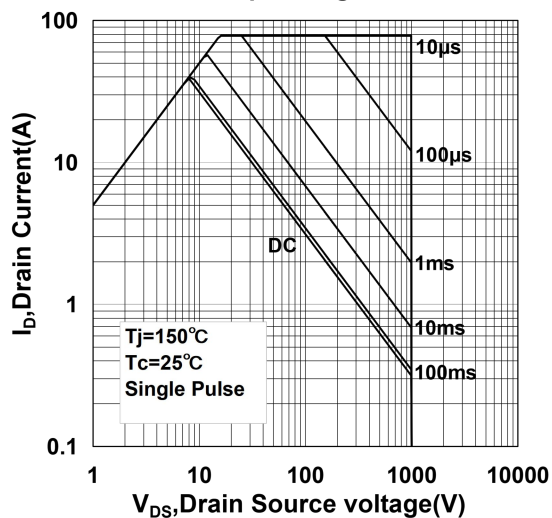
Body Diode Reverse Recovery Time vs Source to Drain Current



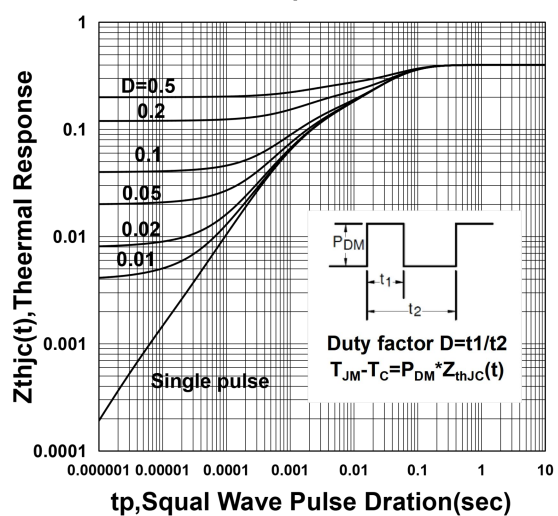
Switching Characteristics



Safe Operating Area



Transient response Curve



Package Mechanical DATA

