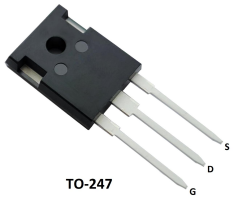
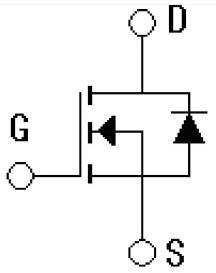
MS38N65FCC

Features



- Optimized body diode reverse recovery performance
- Low on-resistance and low conduction losses
- Small package
- Ultra Low Gate Charge cause lower driving requirements
- 100% avalanche tested
- Improved dv/dt capability

Applications



- Power factor correction（PFC）
- Switched mode power supplies(SMPS)
- Uninterruptible Power Supply（UPS）

Absolute Ratings (Tc=25℃)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	650	V
Drain Current-continuous	I_D T=25℃ T=100℃	38	A
		24	A
Drain Current-pulse (note 1)	I_{DM}	152	A
Gate-Source Voltage	V_{GSS}	±30	V
Single Pulsed Avalanche Energy (note 2)	E_{AS}	841	mJ
Avalanche Current (note 1)	I_{AR}	7	A
Repetitive Avalanche Current (note 1)	E_{AR}	3.9	mJ
Peak Diode Recovery dv/dt (note 3)	dv/dt	50	V/ns
Power Dissipation	PD TC=25℃ Derate above 25℃	322	W
		2.58	W/℃
Operating and Storage Temperature Range	T_J,T_{STG}	-55~+175	℃

Electrical Characteristics(T_{CASE}=25℃ unless otherwise specified)

Parameter	Symbol	Tests conditions	Min	Typ	Max	Units
Drain-Source Voltage	BV_{DSS}	I_D=500μA,V_{GS}=0V	650	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=650V,V_{GS}=0V，T_C=25℃	-	-	3	μA
		V_{DS}=650V，T_C=25℃	-	-	100	μA
Gate body leakage current	I_{GSS}	V_{DS}=0V,V_{GS}=±30V	-	-	±100	nA
On-Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	3	3.5	4.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{DS}=10V,I_D=19A	-	89	109	mΩ
Dynamic Characteristics						
Input capacitance	C_{iss}	V_{DS}=50V, V_{GS}=0V, f=1.0MHZ	-	2800	3200	pF
Output capacitance	C_{oss}		-	97	-	pF
Reverse transfer capacitance	C_{rss}		-	1.5	-	pF

Electrical Characteristics(T_{CASE}=25℃ unless otherwise specified)

Parameter	Symbol	Tests conditions	Min	Typ	Max	Units
Switching-Characteristics						
Turn-On delay time	$t_{d(on)}$	V_{DD}=100V,I_D=9.0A, R_G=25Ω V_{GS}=10V (note 4,5)	-	16	-	ns
Turn-On rise time	t_r		-	13	-	ns
Turn-Off delay time	$t_{d(Off)}$		-	71	-	ns
Turn-Off rise time	t_f		-	13	-	ns
Total Gate Charge	Q_g	V_{DS}=480V,I_D=38A, V_{GS}=10V (note 4,5)	-	45	55	nC
Gate-Source charge	Q_{gs}		-	15	-	nC
Gate-Drain charge	Q_{gd}		-	11.5	-	nC
Drain-Source Diode Characteristics and Maximum Ratings						

Source-Drain Current (Body Diode)	I_{SD}	T_C=25℃	-		38	A
Reverse recovery time	t_{rr}	V_{GS}=0V,I_S=9.0A dI_F/dt=100A/μs (note 4)		180		ns
Reverse recovery charge	Q_{rr}			18		μC

Thermal Characteristic

Parameter	Symbol	Value	Unit
Thermal Resistance,junction to Case	R_{th}(j-C)	0.39	℃/W
Thermal Resistance,junction to Ambient	R_{th}(j-A)	62	℃/W

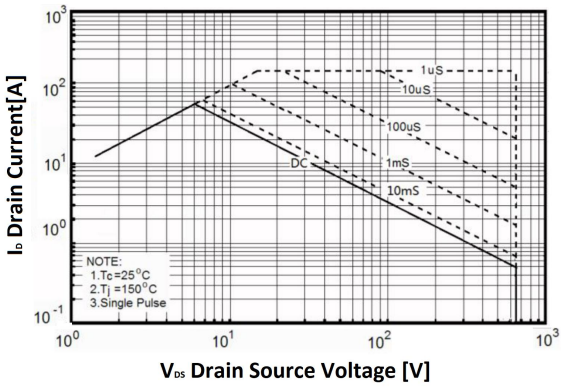
Notes:

1.Repetitive Rating: Pulse width limited by maximum junction temperature

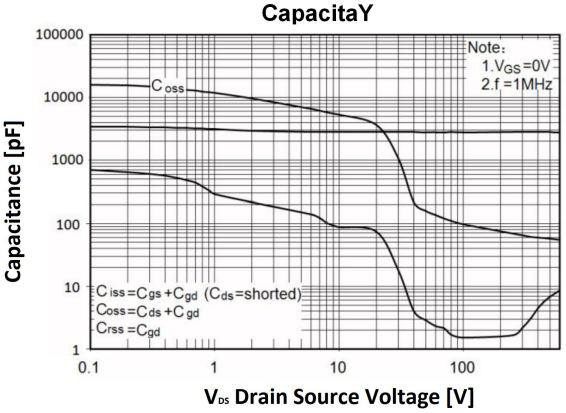
2. Tj=25℃,VDD=50V,VG=10V, R =25Ω

Electrical Characteristics

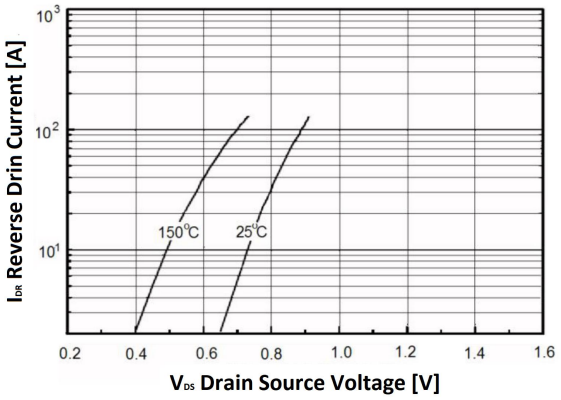
Safe operating area



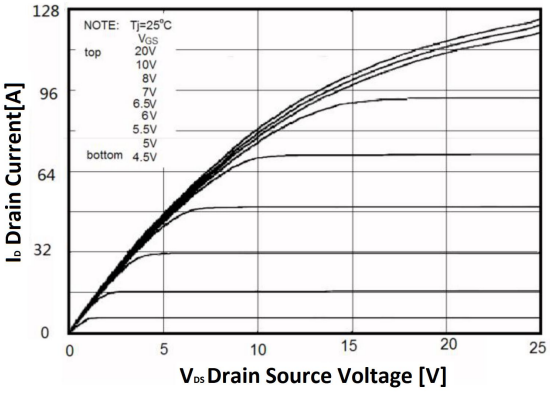
CapacitaY



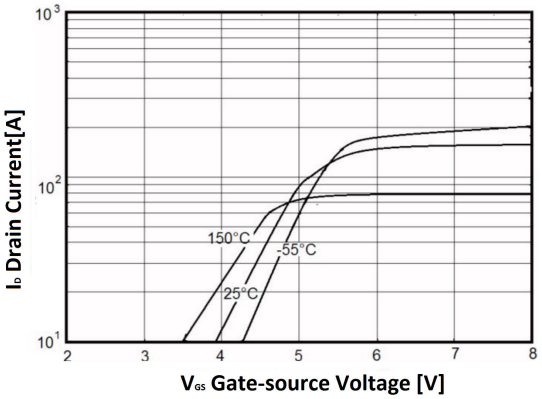
Source-Drain Diode Forward Voltage



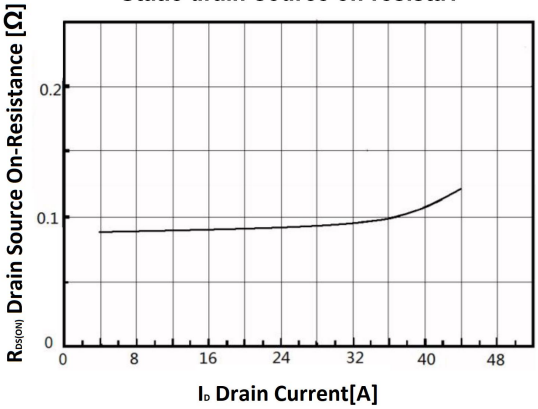
Output characteristics

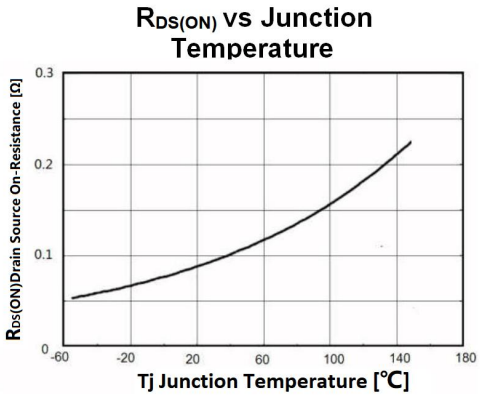


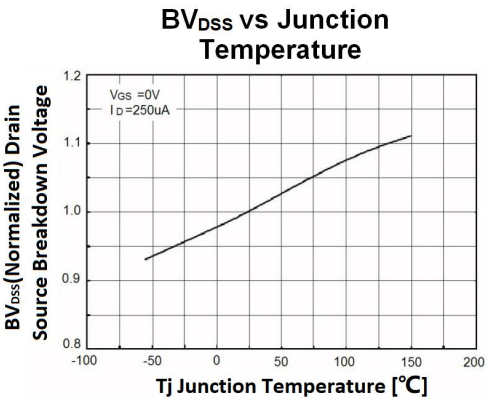
Transfer characteristics

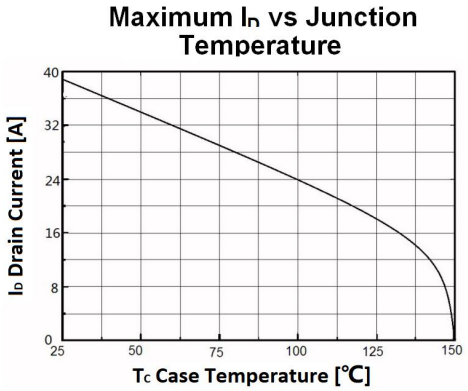


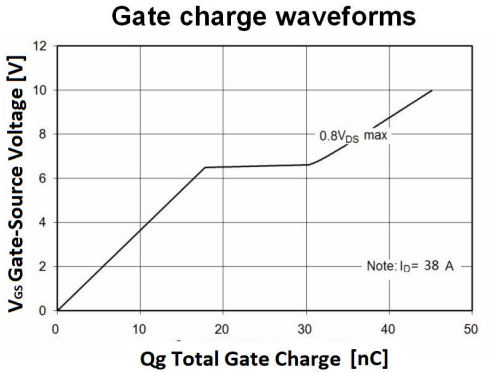
Static drain-source on resistaY





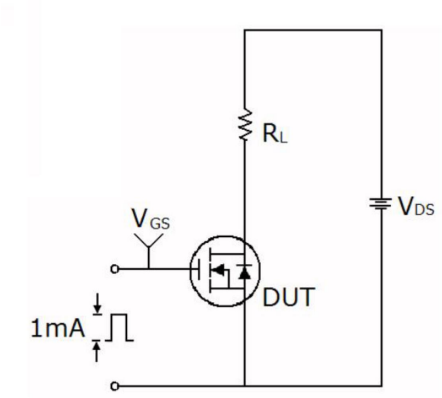


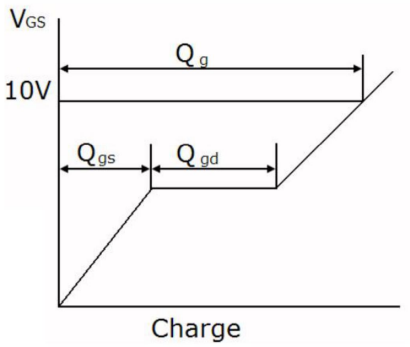




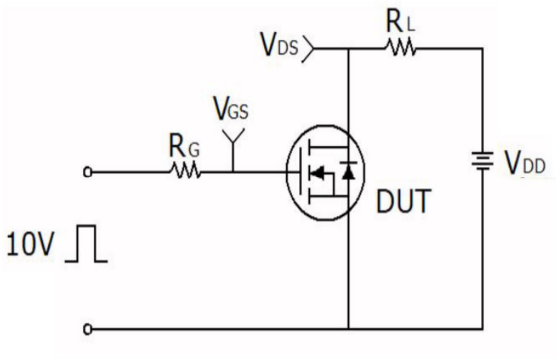
Test Circuit

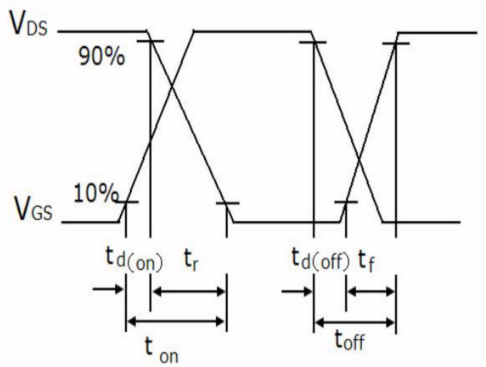
(1) Gate charge test circuit & Waveform



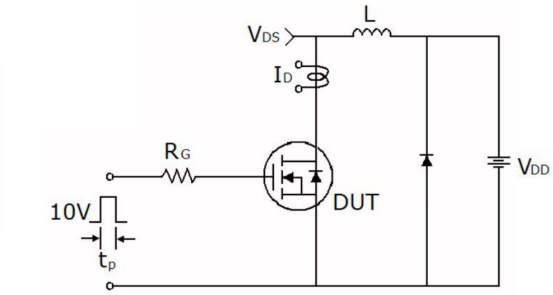


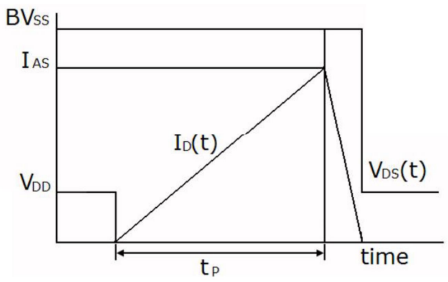
(2) Switch Time Test Circuit



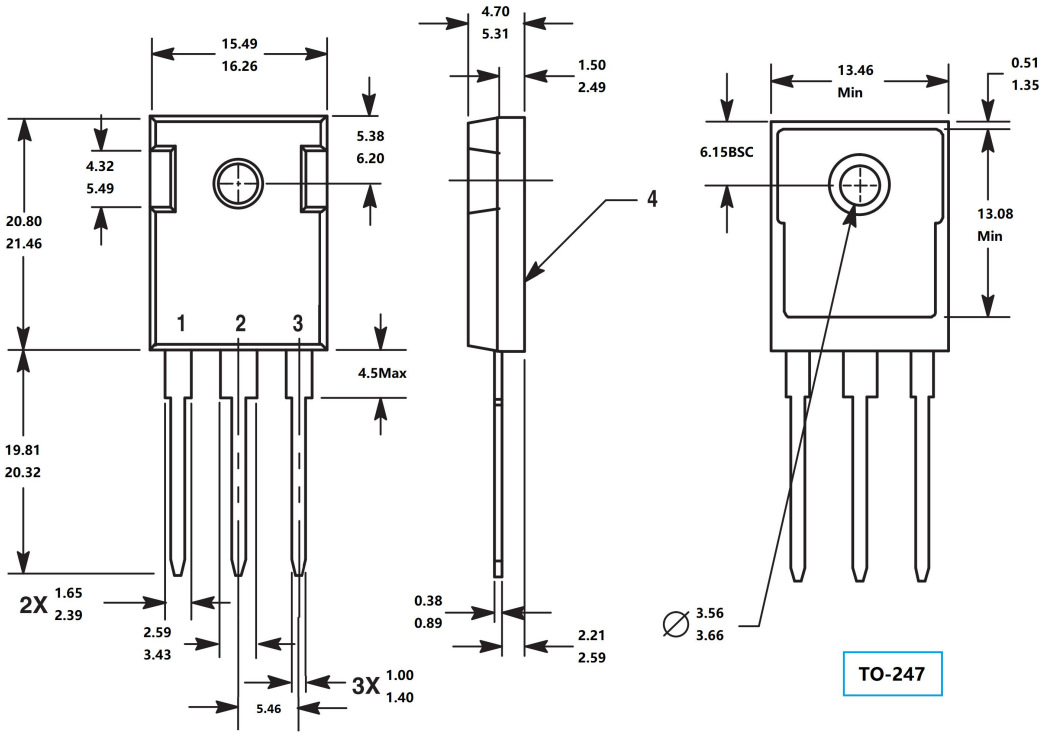


(3) Unclamped Inductive Switching Test Circuit & Waveforms





Package Mechanical DATA



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