Features

- Optimized Body Diode Reverse Recovery Performance
- Low On-resistance and Low Conduction Losses
- Ultra Low Gate Charge Cause Lower Driving Requirement
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free Available Upon Request By Adding Suffix "-HF"
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

N-CHANNEL Super-Junction Power MOSFET

Maximum Ratings

- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 0.83°C/W Junction to Case

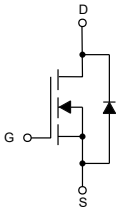
Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	650	V
Gate-Source Volltage		V_{GS}	±30	V
Continuous Drain Current	T_C=25°C	I_D	20	A
	T_C=100°C		12	A
Pulsed Drain Current (Note 1)		I_{DM}	60	A
Single Pulse Avalanche Energy (Note 2)		E_{AS}	484	mJ
Repetitive Avalanche Energy		E_{AR}	0.7	mJ
Avalanche Current		I_{AR}	3.5	A
Total Power Dissipation		P_D	151	W

Note:

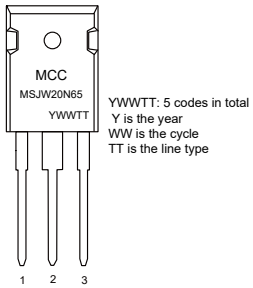
1.Repetitive Rating; Pulse Width Limited by Maximum Junction Temperature.

2.I_{AS}=3.5A, V_{DD}=50V, R_G=25Ω, Starting T_J=25°C.

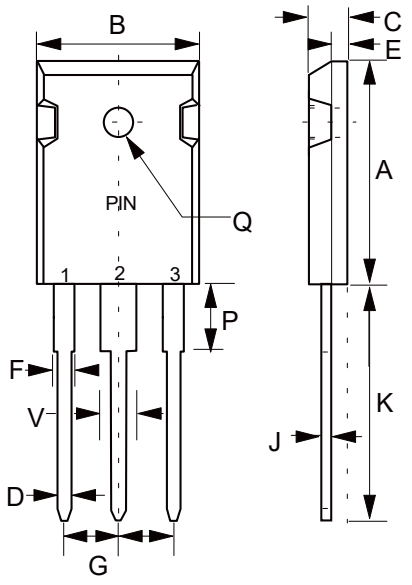
Internal Structure and Marking Code



1. Gate
2. Drain
3. Source



TO-247



DIMENSIONS					
DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.787	0.866	20.00	22.00	
B	0.598	0.638	15.20	16.20	
C	0.185	0.208	4.70	5.30	
D	0.035	0.059	0.90	1.50	
E	0.059	0.094	1.50	2.40	
F	0.067	0.091	1.70	2.30	
J	0.019	0.031	0.48	0.80	
K	0.748	0.833	19.00	21.15	
P	0.122	0.189	3.10	4.80	
Q	0.118	0.150	3.00	3.80	Φ
V	0.106	0.134	2.70	3.40	
G	0.197	0.224	5.00	5.70	

Electrical Characteristics @ 25°C (Unless Otherwise Specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250μA	650			V
Gate-Source Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS} =±30V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=650V, V_{GS}=0V, T_C=25°C			1	μA
		V_{DS}=650V, V_{GS}=0V, T_C=125°C			100	
Gate-Threshold Voltage (Note 3)	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	2.5		4.5	V
Drain-Source On-Resistance (Note 3)	$R_{DS(on)}$	V_{GS}=10V, I_D=10A		150	170	mΩ
Gate Resistance (Note 3)	R_G	f = 1.0MHz Open Drain		12		Ω
Dynamic Characteristics (Note 4)						
Input Capacitance	C_{iss}	V_{DS}=100V,V_{GS}=0V,f=1MHz		1724		pF
Output Capacitance	C_{oss}			61		
Reverse Transfer Capacitance	C_{rss}			6		
Total Gate Charge	Q_g	V_{DS}=520V,V_{GS}=10V,I_D=20A		39		nC
Gate-Source Charge	Q_{gs}			8		
Gate-Drain Charge	Q_{gd}			15		
Turn-On Delay Time	$t_{d(on)}$	V_{DD}=400V,I_D=20A V_{GS}=10V,R_{GEN}=25Ω		15		ns
Turn-On Rise Time	t_r			59		
Turn-Off Delay Time	$t_{d(off)}$			121		
Turn-Off Fall Time	t_f			44		
Drain-Source Diode Characteristics						
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=20A			1.2	V
Continuous Body Diode Current	I_S				20	A
Reverse Recovery Time	t_{rr}	V_R=400V, I_F=I_S, di_F/dt = 100A/μs		423		ns
Reverse Recovery Charge	Q_{rr}			5.3		μC
Peak Reverse Recovery Current	I_{rrm}			25		A

Note:
3.Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 1% .
4.Guaranteed by Design, not Subject to Production.

Curve Characteristics

Fig. 1 - Typical Output Characteristics

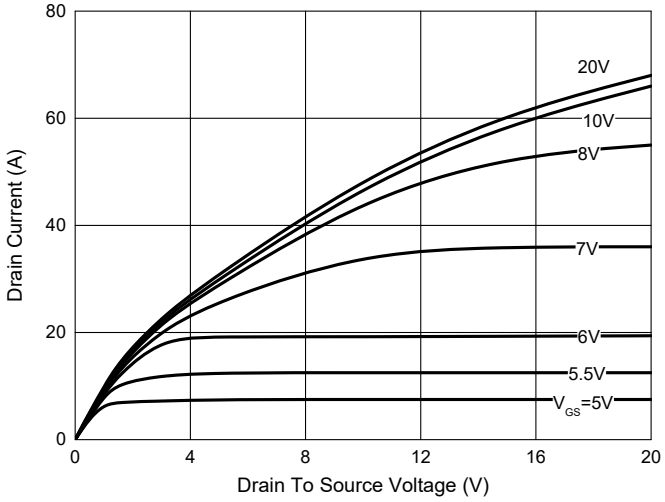


Fig. 2 - Transfer Characteristics

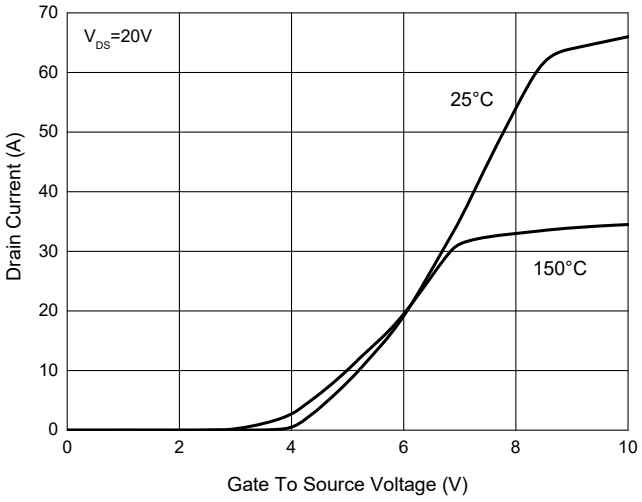


Fig. 3 - $R_{DS(ON)}$—I_D

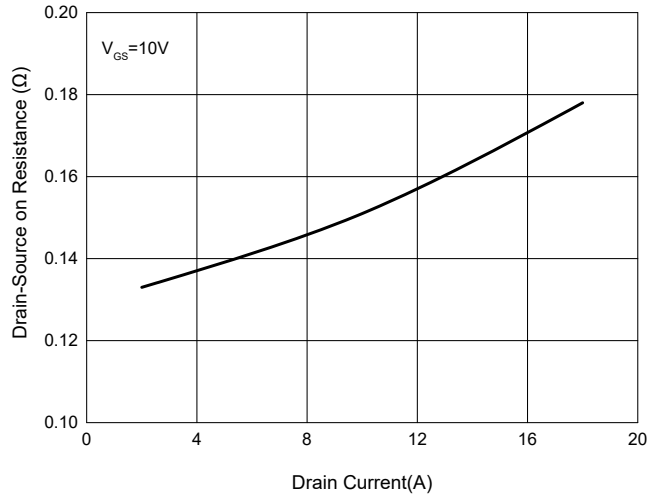


Fig. 4 - Capacitance Characteristics

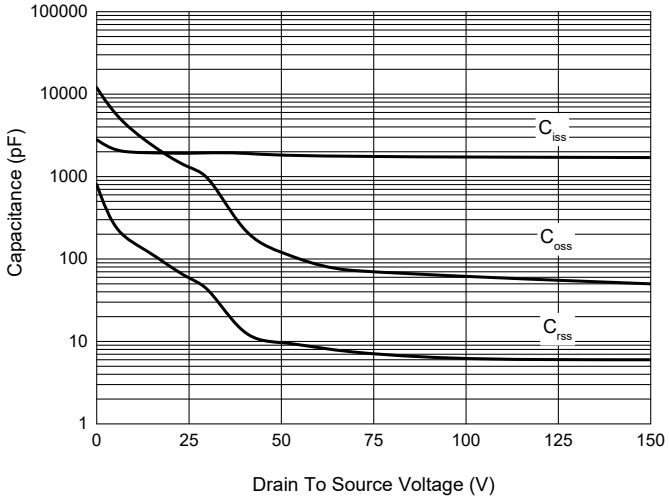


Fig. 5 - Total Gate Charge Characteristics

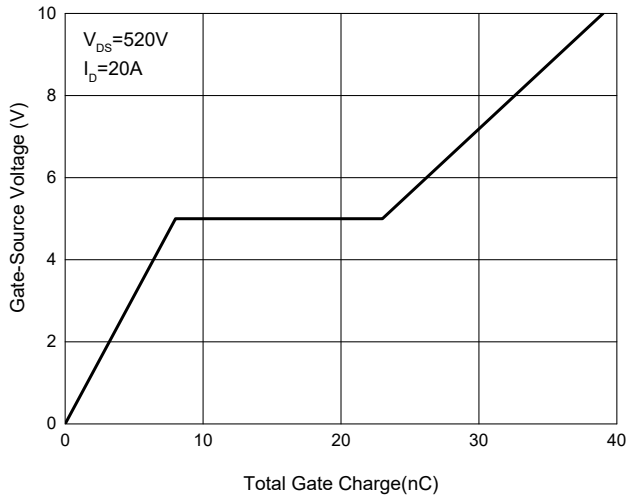
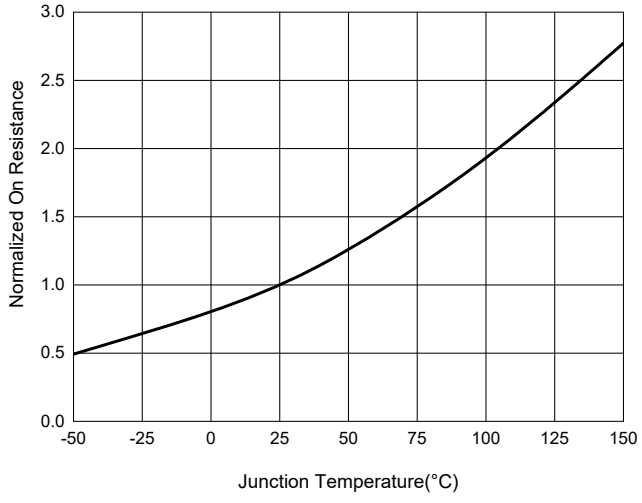


Fig. 6 - Normalized On Resistance Characteristics



Ordering Information

Device	Packing
MSJW20N65-BP	Tube:30pcs/Tube, 360pcs/Box,1.8K/Ctn;

Note : Adding "-HF" Suffix For Halogen Free, eg. Part Number-BP-HF

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