

Features

- Very Low FOM $RDS_{(on)} \times Q_g$
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free. "Green" Device (Note 1)
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

Maximum Ratings

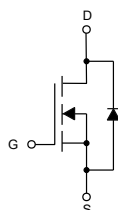
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 36°C/W Junction to Ambient(Steady-State)^(Note2)
- Thermal Resistance: 0.45°C/W Junction to Case(Steady-State)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	600	V
Gate-Source Voltage	V_{GS}	±30	V
Continuous Drain Current	I_D	$T_C=25^\circ\text{C}$	47
		$T_C=100^\circ\text{C}$	30
Pulsed Drain Current ^(Note3)	I_{DM}	185	A
Total Power Dissipation ^(Note4)	P_D	278	W
Single Pulsed Avalanche Energy ^(Note5)	E_{AS}	300	mJ

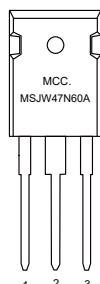
Note:

1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^\circ\text{C}$. The Power dissipation P_{DSM} is based on $R_{\theta JA} \leq 10\text{s}$ and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.
3. Repetitive rating; pulse width limited by max. junction temperature.
4. P_D is based on max. junction temperature, using junction-case thermal resistance.
5. $T_J=25^\circ\text{C}$, $V_{DD}=50\text{V}$, $V_{GS}=10\text{V}$, $L=50\text{mH}$.

Internal Structure and Marking Code

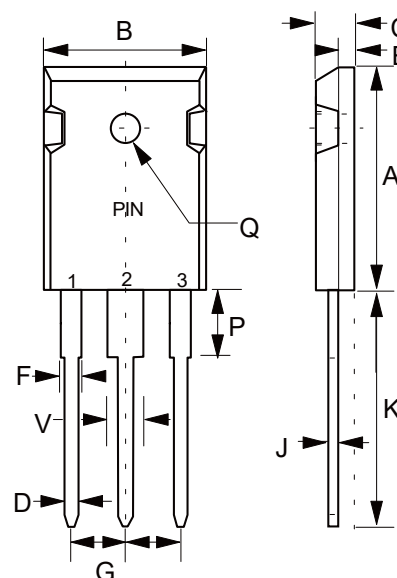


1. Gate
2. Drain
3. Source



N-CHANNEL Super-Junction Power MOSFET

TO-247



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	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	600			V
Gate-Source Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 30V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=600V, V_{GS}=0V$			1	μA
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2	3.1	4	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=10A$		60	91	m Ω
Gate Resistance	R_g	F=1 MHz, Open drain		2.4		Ω
Diode Characteristics						
Continuous Body Diode Current	I_S				47	A
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=20A$			1.4	V
Reverse Recovery Time	t_{rr}	$I_F=20A, dI_F/dt=100A/\mu s$		381		ns
Reverse Recovery Charge	Q_{rr}			6595		nC
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS}=300V, V_{GS}=0V, f=1MHz$		4476		pF
Output Capacitance	C_{oss}			126		
Reverse Transfer Capacitance	C_{rss}			18		
Total Gate Charge	Q_g	$V_{DS}=300V, V_{GS}=10V, I_D=20A$		123		nC
Gate-Source Charge	Q_{gs}			23		
Gate-Drain Charge	Q_{gd}			47.5		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=300V, V_{GS}=10V,$ $R_{GEN}=6\Omega, I_{DS}=20A$		26		ns
Turn-On Rise Time	t_r			53		
Turn-Off Delay Time	$t_{d(off)}$			171		
Turn-Off Fall Time	t_f			50		

Fig. 1 - Typical Output Characteristics

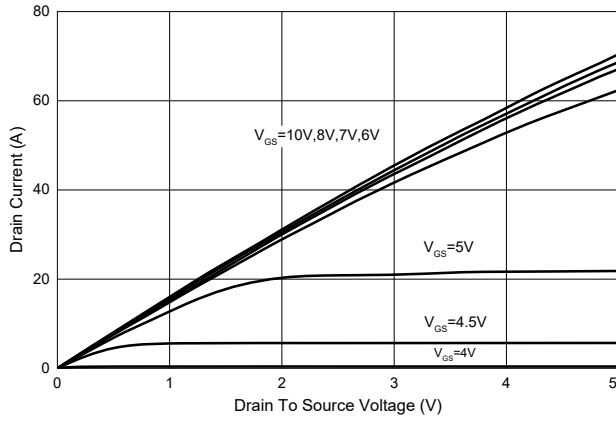


Fig. 2 - Transfer Characteristics

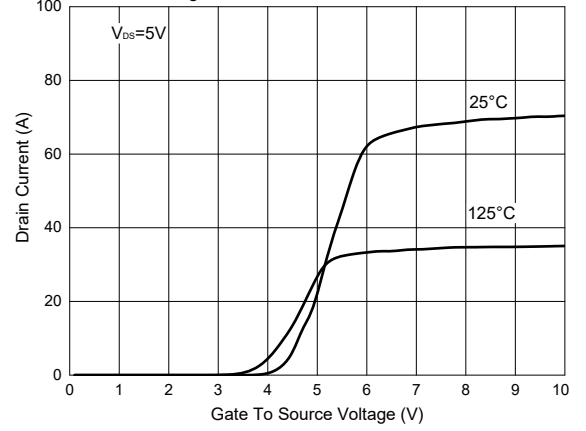


Fig. 3 - $R_{DS(ON)} - V_{GS}$

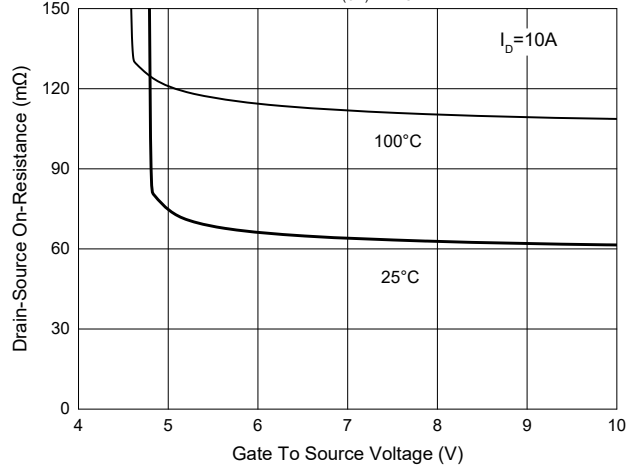


Fig. 4 - $R_{DS(ON)} - I_D$

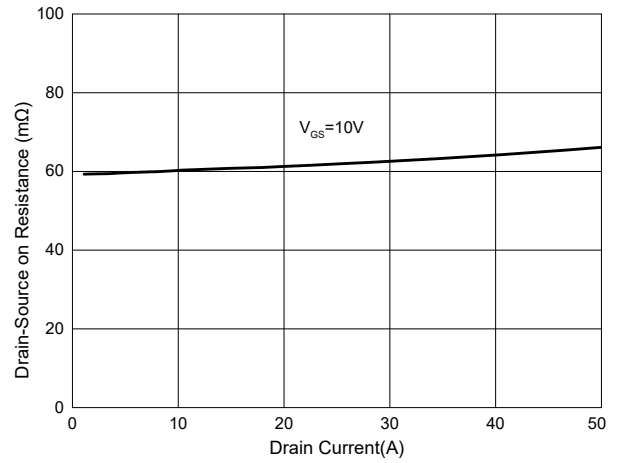


Fig. 5 - Gate Charge

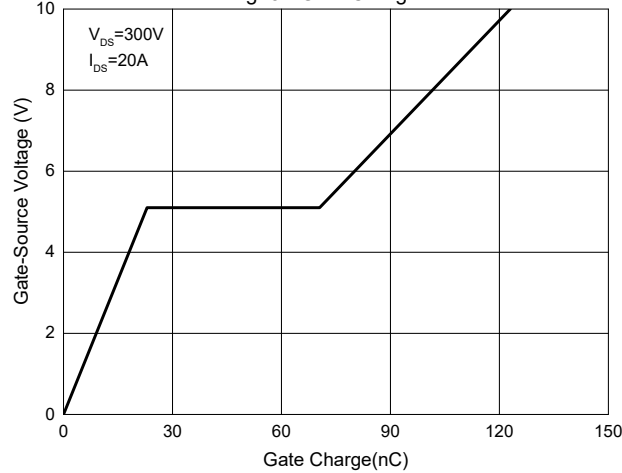


Fig. 6 - Threshold Voltage

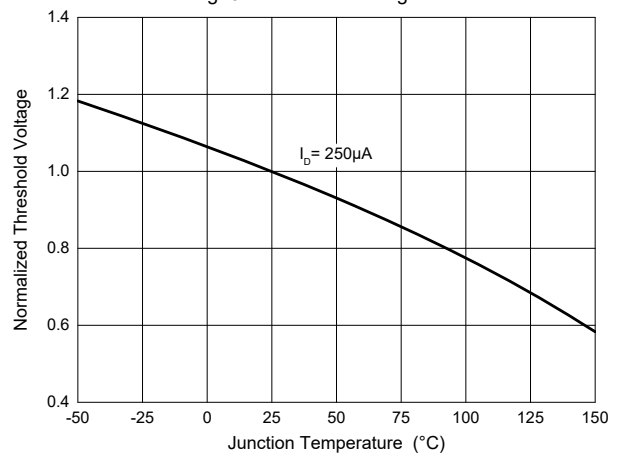


Fig. 7 - Normalized On Resistance Characteristics

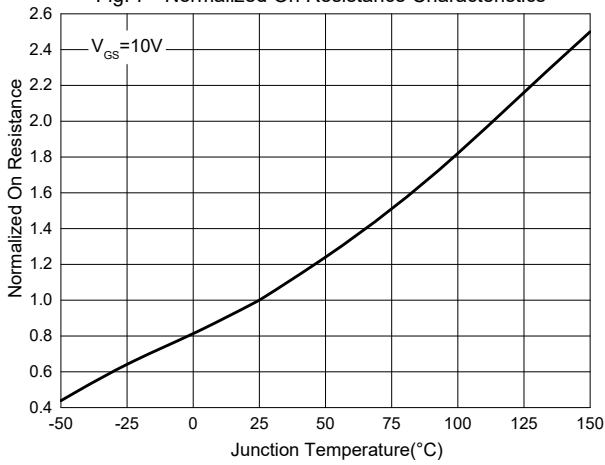


Fig. 8 - $I_S - V_{SD}$

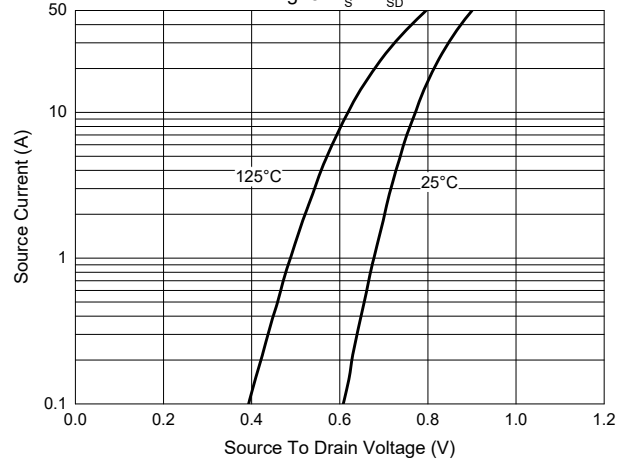


Fig. 9 - Capacitance Characteristics

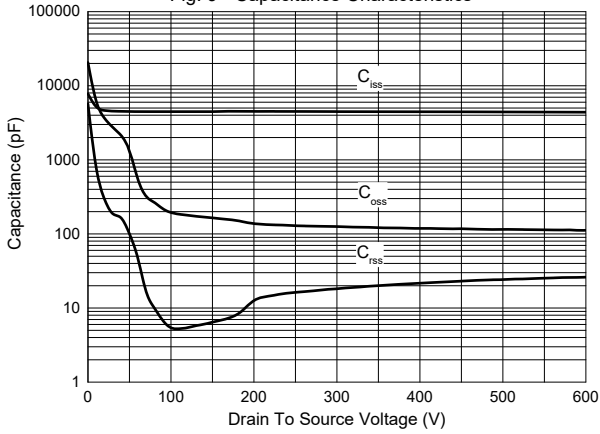


Fig. 10 - Current Dissipation

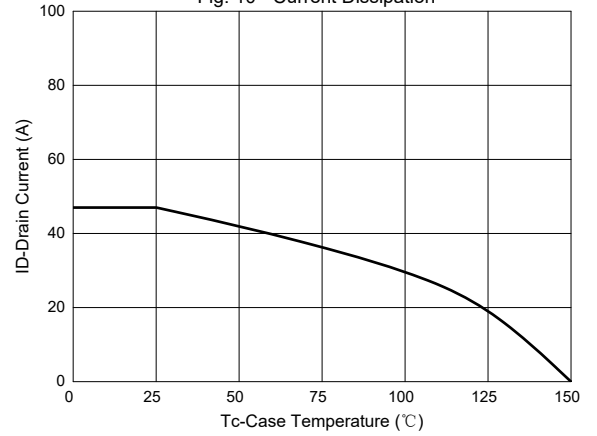


Fig. 11 - PD—TJ

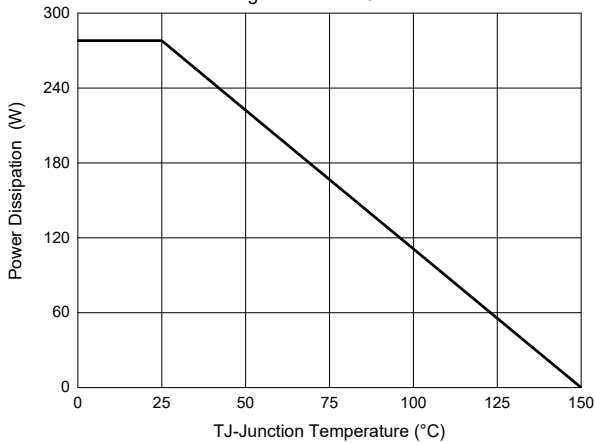


Fig. 12 - Safe Operation Area

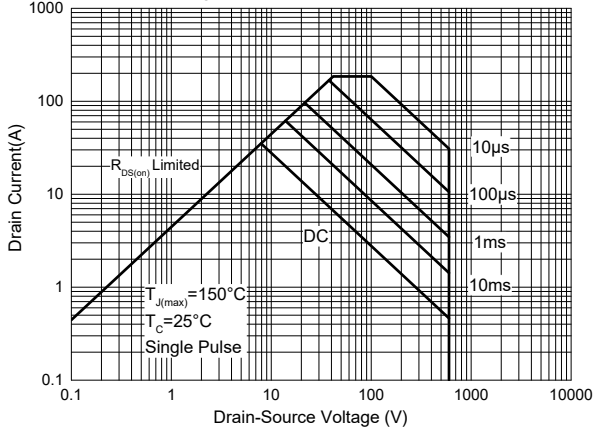
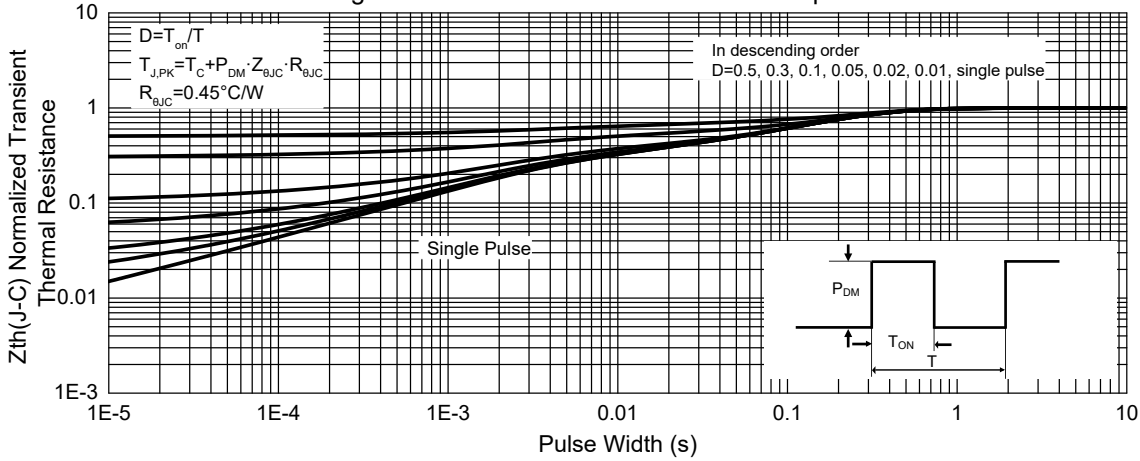


Fig. 13 - Normalized Transient Thermal Impedance



Ordering Information

Device	Packing
MSJW47N60A-BP	Tube:30pcs/Tube, 360pcs/Box,1.8K/Ctn;

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