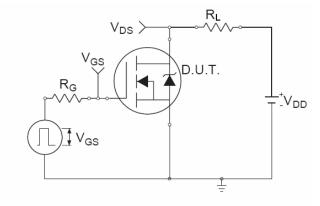
### **Features**

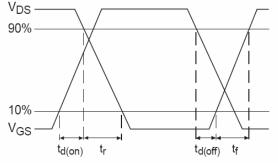
- $V_{DSS}$ =68V/ $V_{GSS}$ =±25V/ $I_{D}$ =80A  $R_{DS(ON)}$ =10.8m $\Omega$ (Max.)@ $V_{GS}$ =10V
- Avalanche Rated
- Reliable and Rugged
- Advanced trench process technology
- High Density Cell Design For Ultra Low On-Resistance

### **Applications**

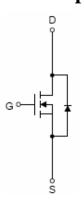
• Power Management in Inverter System

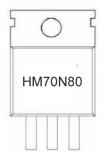
## **Switching Time Test Circuit and Waveforms**





### **Pin Description**





Marking and pin Assignment



TO-220-3L top view

### **Package Marking And Ordering Information**

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
PTÏ€ÞÌ€	PTÏ€ÞÌ€	TO-220-3L		-	-

### **Absolute Maximum Ratings** (T<sub>A</sub>=25°C unless otherwise noted)

Symbol	Parameter	Typical	Unit
$ m V_{DSS}$	Drain-Source Voltage	68	V
$V_{ m GSS}$	Gate –Source Voltage	±25	V
$I_D$	Continuous Drain Current  T <sub>C</sub> =100°C	75	A
	Continuous Diani Current	80	A
$I_{DP}$	300us Pulsed Drain Current Tested T <sub>C</sub> =25°C	300	A
$I_{S}$	Diode Continuous Forward Current	80	A
$T_{\mathrm{J}}$	Operating Junction Temperature	175	°C
$T_{STG}$	Storage Temperature Range	-55 ~ 175	°C

### **Electrical Characteristics** (TA=25°C unless otherwise noted)

Symbol	Parameter	<b>Test Conditions</b>	Min.	Тур	Max.	Unit		
Static Char	acteristics							
$\mathrm{BV}_{\mathrm{DSS}}$	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V,I <sub>D</sub> =250uA	68			V		
$I_{ m DSS}$	Zero Gate Voltage Drain Current	$V_{DS} = 60V, V_{GS} = 0V$			1	uA		
		$T_J=85^{\circ}C$			30			
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS},I_{D}=250uA$	2	3	4	V		
$I_{GSS}$	Gate Leakage Current	$V_{GS} = \pm 25V, V_{DS} = 0V$			±100	nA		
$R_{DS(on)}^{1}$	Drain-Source On-Resistance	$V_{GS}=10V, I_{D}=40A$		9	10.8	mΩ		
<b>Diode Char</b>	acteristics							
${ m V_{SD}}^1$	Diode Forward Voltage	$I_{SD}=20A, V_{GS}=0V$		0.8	1.1	V		
$t_{\mathrm{rr}}$	Reverse Recovery Time	$I_{SD}=40A$ ,		55		ns		
$Q_{rr}$	Reverse Recovery Charge	$dI_{SD}/dt=100A/us$		117		nC		
Dynamic C	Dynamic Characteristics <sup>2</sup>							
$R_{G}$	Gate Resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, Frequency=1MHz		1.5		Ω		
$C_{iss}$	Input Capacitance			2200		pF		
$C_{oss}$	Output Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> =30V Frequency=1MHz		470				
$C_{rss}$	Reverse Transfer Capacitance	rrequency-riviriz		190				
$t_{d(on)}$	Turn-On Delay Time	$V_{DD}$ =15V, $R_L$ =15 $\Omega$		23	42			
$t_r$	Turn-On Rise Time	$I_D=1.0A, V_{GEN}=-10V$		12	23	ns		
$t_{d(off)}$	Turn-Off Delay Time	$R_G=6\Omega$		77	140			
$t_{\mathrm{f}}$	Turn-Off Fall Time	NG 022		69	125			
Gate Charg	Gate Charge Characteristics <sup>2</sup>							
$Q_{\mathrm{g}}$	Total Gate Charge	$V_{DS}$ =-15V, $V_{GS}$ =-4.5V		52	73			
$Q_{gs}$	Gate-Source Charge	$I_{D}=2.5A$		19		nC		
$Q_{gd}$	Gate-Drain Charge	1D 2.3/1		27				

Note: 1: Pulse test; pulse width  $\leq 300$ ns, duty cycle  $\leq 2\%$ .

### **Typical Characteristics**

<sup>2:</sup> Guaranteed by design, not subject to production testing.

## 250 250 200 150 100 50 T<sub>c</sub>=25°C

60

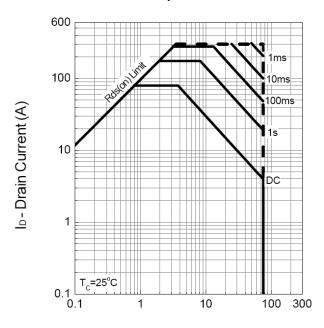
T<sub>j</sub>- Junction Temperature (°C)

80 100 120 140 160 180 200

# Drain Current 100 80 40 20 T<sub>c</sub>=25°C,V<sub>G</sub>=10V 0 20 40 60 80 100 120 140 160 180 200

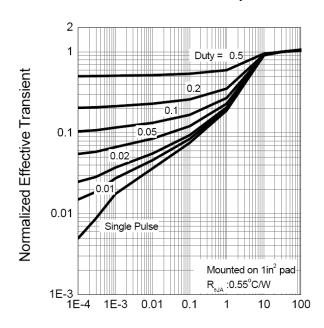
T<sub>j</sub> - Junction Temperature (°C)

### Safe Operation Area



V<sub>DS</sub> - Drain - Source Voltage (V)

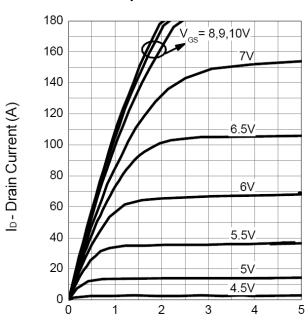
### Thermal Transient Impedance



Square Wave Pulse Duration (sec)

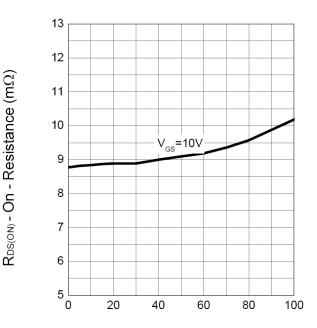
### **Typical Characteristics (Cont.)**

### **Output Characteristics**



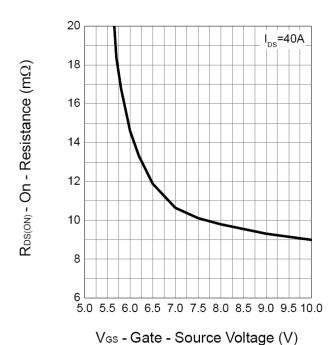
V<sub>DS</sub> - Drain-Source Voltage (V)

### **Drain-Source On Resistance**



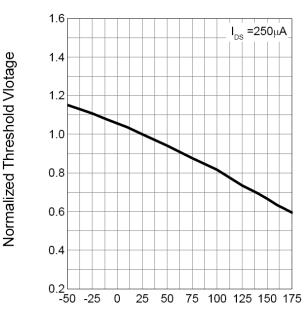
I<sub>D</sub> - Drain Current (A)

### Gate-Source On Resistance



**Typical Characteristics (Cont.)** 

### **Gate Threshold Voltage**



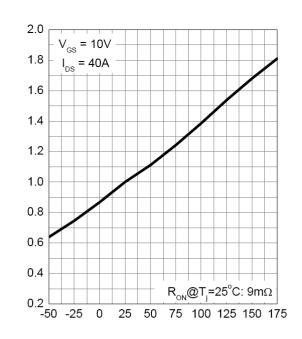
T<sub>j</sub> - Junction Temperature (°C)

Normalized On Resistance

ls - Source Current (A)

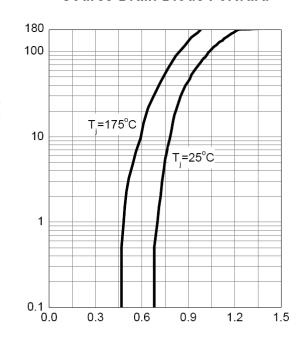
Ves - Gate-source Voltage (V)

### **Drain-Source On Resistance**



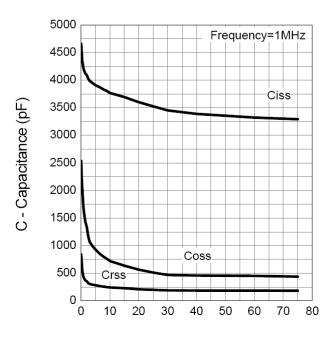
T<sub>j</sub> - Junction Temperature (°C)

### Source-Drain Diode Forward



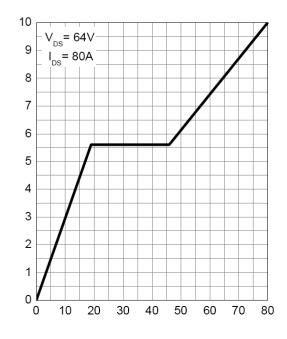
V<sub>SD</sub> - Source-Drain Voltage (V)

### Capacitance



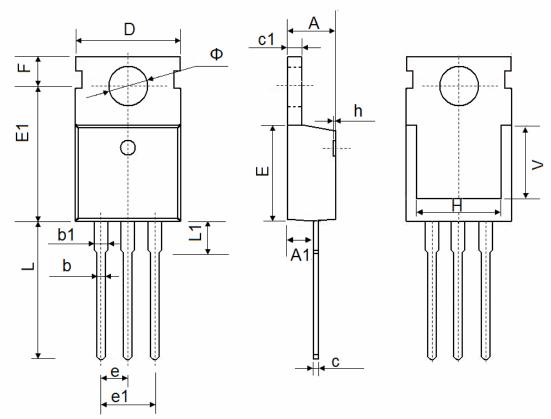
V<sub>DS</sub> - Drain - Source Voltage (V)

### **Gate Charge**



Q<sub>G</sub> - Gate Charge (nC)

### **TO-220-3L Package Information**



Symbol	Dimensions	s In Millimeters	Dimensions In Inches			
	Min.	Max.	Min.	Max.		
А	4.400	4.600	0.173	0.181		
A1	2.250	2.550	0.089	0.100		
b	0.710	0.910	0.028	0.036		
b1	1.170	1.370	0.046	0.054		
С	0.330	0.650	0.013	0.026		
c1	1.200	1.400	0.047	0.055		
D	9.910	10.250	0.390	0.404		
Е	8.9500	9.750	0.352	0.384		
E1	12.650	12.950	0.498	0.510		
е	2.54	2.540 TYP.		0.100 TYP.		
e1	4.980	5.180	0.196	0.204		
F	2.650	2.950	0.104	0.116		
Н	7.900	8.100	0.311	0.319		
h	0.000	0.300	0.000	0.012		
L	12.900	13.400	0.508	0.528		
L1	2.850	3.250	0.112	0.128		
V	7.500 REF.		0.295 REF.			
Ф	3.400	3.800	0.134	0.150		

## H&M 华之美半导体 "J O 92P:2 SEMI www.hmsemi.com """68V<sub>DS</sub>/±25V<sub>GS</sub>/80A(I<sub>D</sub>) N-Channel Enhancement Mode MOSFET

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