

## N- Channel 70-V (D-S) MOSFET

### 1. Description

The HP1010E is the N-Channel logic enhancement mode power field effect transistors are produced using high cell density, DMOS trench technology. This high density process is especially tailored to minimize on-state resistance.

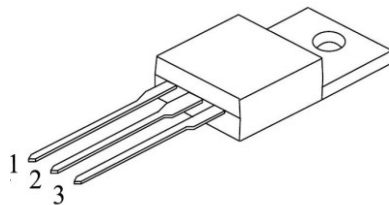
### 2. Feature

- $R_{DS(ON)Typ} \leq 6m\Omega @ V_{GS}=10V$
- Low ON Resistance
- Low Gate Charge
- Peak Current vs Pulse Width Curve

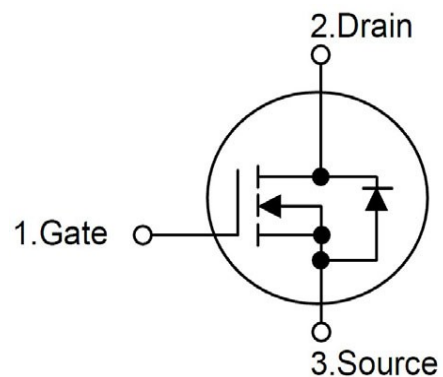
V <sub>DS</sub>	70	V
R <sub>DS(on)Typ</sub>	6	mΩ
I <sub>D</sub>	90	A

### 3. Pin configuration

Order Number	Package
HP1010E	TO-220



**TO-220**



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**4. Absolute maximum ratings (Tc=25°C Unless Otherwise Noted)**

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V <sub>DSS</sub>	70	V
Gate-Source Voltage		V <sub>GSS</sub>	±25	V
Continuous Drain Current	T <sub>c</sub> =25°C	I <sub>D</sub>	90	A
	T <sub>c</sub> =100°C		65	A
Pulsed Drain Current		I <sub>DM</sub>	320	A
Power Dissipation	T <sub>c</sub> =25°C	PD	130	W
	Derating Factor above 25°C		1.54	W/°C
Operating Junction and Storage Temperature Range		T <sub>J</sub> , T <sub>stg</sub>	-55 to 175	°C

**5. Thermal characteristics**

Parameter	Symbol	Ratings	Units
Thermal resistance, case-to-sink typ.	R <sub>thCS</sub>	0.5	°C/W
Thermal resistance junction to case.	R <sub>thJC</sub>	0.65	°C/W
Thermal resistance junction to ambient.	R <sub>thJA</sub>	62	°C/W

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**6. Electrical characteristics (TA =25°C Unless Otherwise Specified)**

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
<b>STATIC</b>						
BVDSS	Drain-Source Breakdown Voltage	VGS=0V, ID=250μA	70	-	-	V
VGS(th)	Gate Threshold Voltage	VDS=VGS, ID=250μA	2	-	4	V
IGSS	Gate-Body Leakage	VDS=0V, VGS=±25V	-	-	±100	nA
IDSS	Zero Gate Voltage Drain Current	VDS=68V, VGS=0V	-	-	1	μA
RDS(ON)	Drain-Source On-Resistance	VGS=10V, ID=35A	-	6	8	mΩ
VSD	Diode Forward Voltage	IS=20A, VGS=0V	-	-	1.5	V
<b>DYNAMIC</b>						
Qg	Total Gate Charge	VDD=30V, VGS=10V, ID=30A	-	65	-	
Qgs	Gate-Source Charge		-	12	-	
Qgd	Gate-Drain Charge		-	21	-	
Ciss	Input Capacitance	VDS=30V, VGS=0V, f=1MHz	-	2900	-	pF
Coss	Output Capacitance		-	340	-	
Crss	Reverse Transfer Capacitance		-	200	-	
td(on)	Turn-On Delay Time	VGS =10V, Id=1A, VDD=30V, RG=8Ω	-	13	-	ns
tr	Turn-On Rise Time		-	15	-	
td(off)	Turn-Off Delay Time		-	29	-	
tf	Turn-Off Fall Time		-	55	-	
trr	Reverse Recovery Time	VGS=0V, IF=40A, di/dt=100A/us	-	49	-	
Qrr	Reverse Recovery Charge		-	93	-	

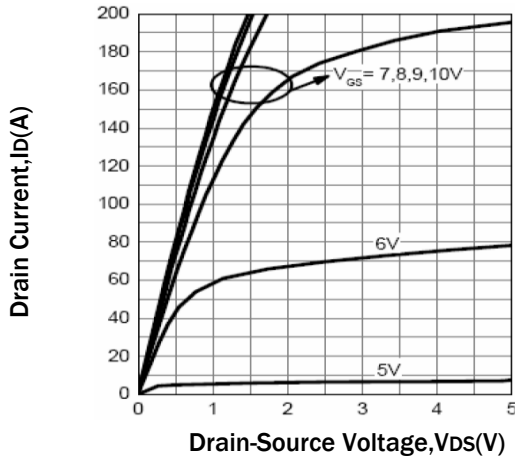
Notes :a. pulse test:pulse width 300 us,duty cycle 2% ,Guaranteed by design,not subject to production testing.

YOMOS reserves the right to improve product design,functions and reliability without notice.

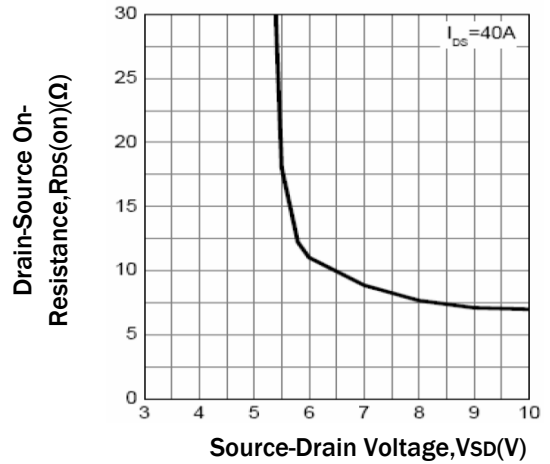
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**7. Typical Characteristics (T<sub>J</sub> =25°C Noted)**

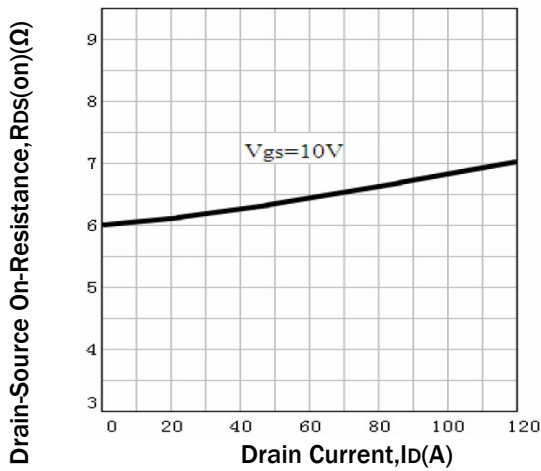
**On-Region Characteristics**



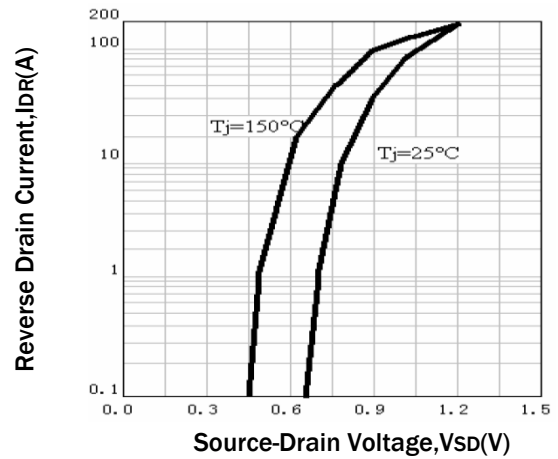
**Drain-Source On Resistance**



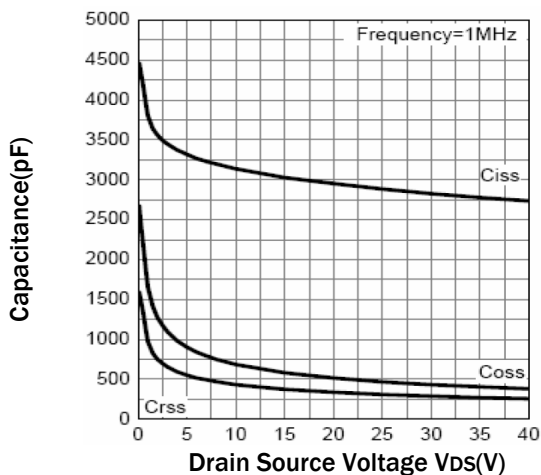
**On-Resistance Variation vs. Drain Current and Gate Voltage**



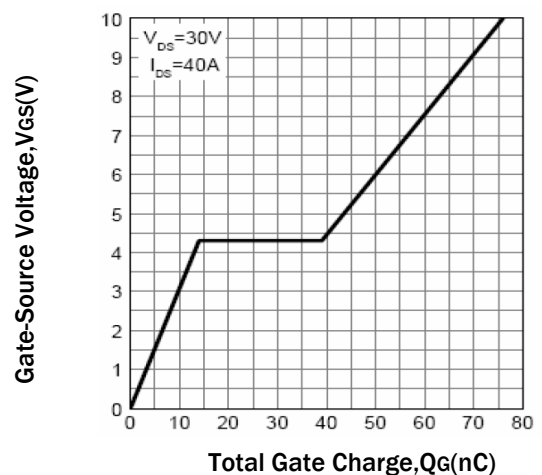
**Body Diode Forward Voltage Variation vs. Source Current and Temperature**



**Capacitance Characteristics**



**Gate Charge vs. Gate-to-Source Voltage**



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**8.Package Information:**

**Unit: mm**

