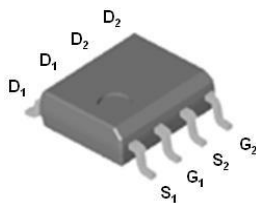


# P1004HV

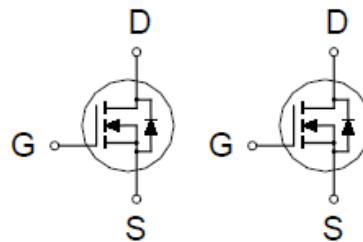
## N-Channel Enhancement Mode MOSFET

### PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	$I_D$
40V	13m $\Omega$ @ $V_{GS} = 10V$	10A



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### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25\text{ }^\circ\text{C}$ Unless Otherwise Noted)

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Drain-Source Voltage		$V_{DS}$	40	V
Gate-Source Voltage		$V_{GS}$	$\pm 24$	
Continuous Drain Current	$T_A = 25\text{ }^\circ\text{C}$	$I_D$	10	A
	$T_A = 70\text{ }^\circ\text{C}$		8	
Pulsed Drain Current <sup>1</sup>		$I_{DM}$	40	
Avalanche Current		$I_{AS}$	38	
Avalanche Energy <sup>2</sup>	$L = 0.1\text{mH}$	$E_{AS}$	71	mJ
Power Dissipation	$T_A = 25\text{ }^\circ\text{C}$	$P_D$	2	W
	$T_A = 70\text{ }^\circ\text{C}$		1.28	
Operating Junction & Storage Temperature Range		$T_J, T_{STG}$	-55 to 150	$^\circ\text{C}$
Lead Temperature ( $1/16$ " from case for 10 sec)		$T_L$	275	

### THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Ambient	$R_{\theta JA}$		62.5	$^\circ\text{C} / \text{W}$
Junction-to-Lead	$R_{\theta JL}$		25	

<sup>1</sup>Pulse width limited by maximum junction temperature.

<sup>2</sup> $V_{DD} = 20V$ , Starting  $T_J = 25^\circ\text{C}$ .

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## N-Channel Enhancement Mode MOSFET

### ELECTRICAL CHARACTERISTICS (T<sub>J</sub> = 25 °C, Unless Otherwise Noted)

PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX	
<b>STATIC</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA	40			V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	1.7	2.0	3.0	V
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±24V			±100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 32V, V <sub>GS</sub> = 0V			1	μA
		V <sub>DS</sub> = 30V, V <sub>GS</sub> = 0V, T <sub>J</sub> = 55 °C			10	
On-State Drain Current <sup>1</sup>	I <sub>D(ON)</sub>	V <sub>DS</sub> = 10V, V <sub>GS</sub> = 10V	40			A
Drain-Source On-State Resistance <sup>1</sup>	R <sub>DS(ON)</sub>	V <sub>GS</sub> = 5V, I <sub>D</sub> = 8A		17	20	mΩ
		V <sub>GS</sub> = 10V, I <sub>D</sub> = 15A		12	13	
Forward Transconductance <sup>1</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 10V, I <sub>D</sub> = 20A		25		S
<b>DYNAMIC</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> = 0V, V <sub>DS</sub> = 20V, f = 1MHz		1570		pF
Output Capacitance	C <sub>oss</sub>			273		
Reverse Transfer Capacitance	C <sub>rss</sub>			183		
Gate Resistance	R <sub>g</sub>	V <sub>GS</sub> = 0V, V <sub>DS</sub> = 0V, f = 1MHz		1.38		Ω
Total Gate Charge <sup>2</sup>	Q <sub>g</sub>	V <sub>DS</sub> = 0.5V <sub>(BR)DSS</sub> , V <sub>GS</sub> = 10V, I <sub>D</sub> = 15A		29		nC
Gate-Source Charge <sup>2</sup>	Q <sub>gs</sub>			8		
Gate-Drain Charge <sup>2</sup>	Q <sub>gd</sub>			7		
Turn-On Delay Time <sup>2</sup>	t <sub>d(on)</sub>	V <sub>DS</sub> = 20V, R <sub>L</sub> = 1Ω I <sub>D</sub> ≅ 20A, V <sub>GS</sub> = 10V, R <sub>GEN</sub> = 6Ω		12	33	nS
Rise Time <sup>2</sup>	t <sub>r</sub>			35	65	
Turn-Off Delay Time <sup>2</sup>	t <sub>d(off)</sub>			37	68	
Fall Time <sup>2</sup>	t <sub>f</sub>			12	23	
<b>SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T<sub>J</sub> = 25 °C)</b>						
Continuous Current	I <sub>S</sub>				2	A
Forward Voltage <sup>1</sup>	V <sub>SD</sub>	I <sub>F</sub> = I <sub>S</sub> , V <sub>GS</sub> = 0V			1	V
Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 20A, di <sub>F</sub> /dt = 100A / μS		75		nS
Reverse Recovery Charge	Q <sub>rr</sub>				55	

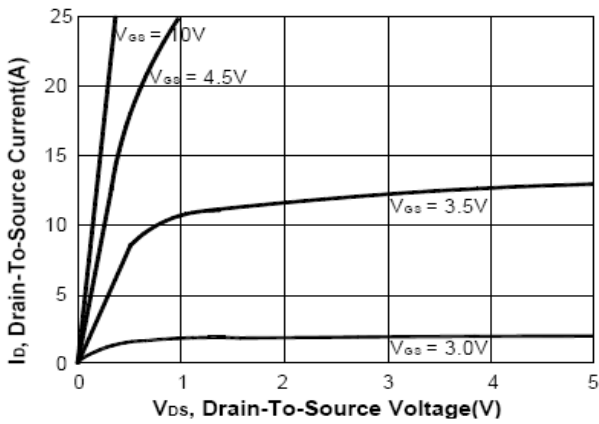
<sup>1</sup>Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.

<sup>2</sup>Independent of operating temperature.

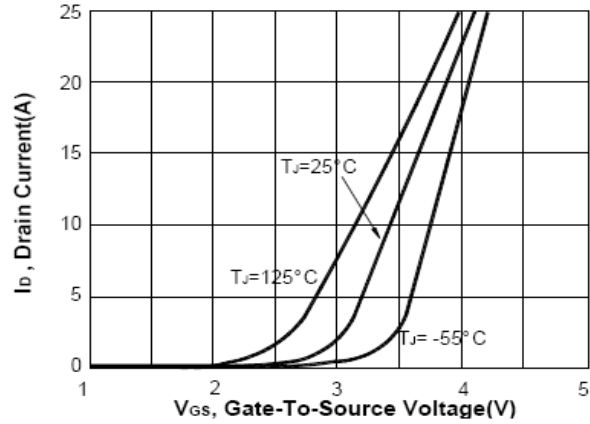
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## N-Channel Enhancement Mode MOSFET

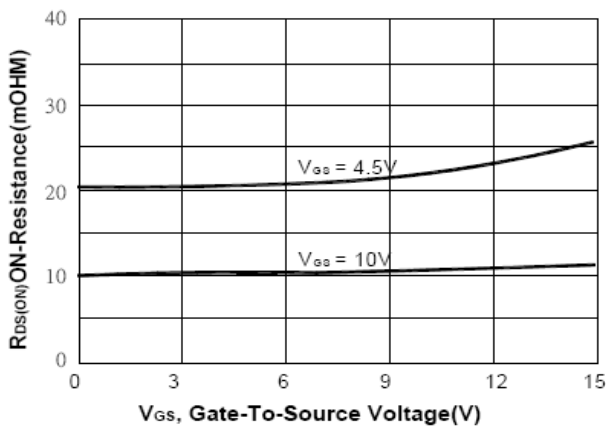
**Output Characteristics**



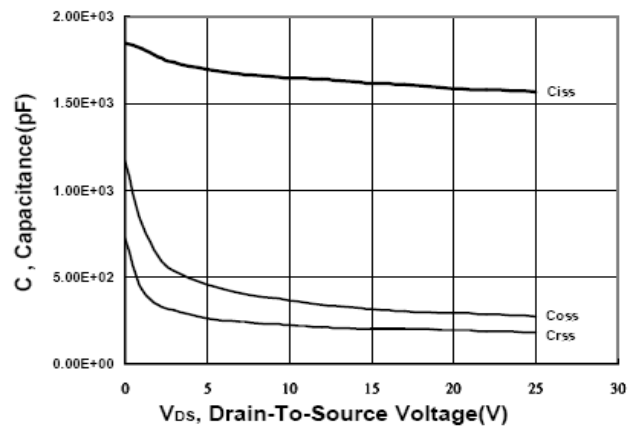
**Transfer Characteristics**



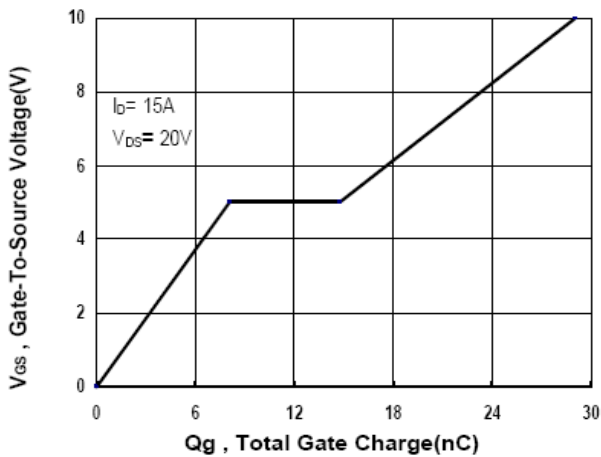
**On-Resistance VS Gate-To-Source**



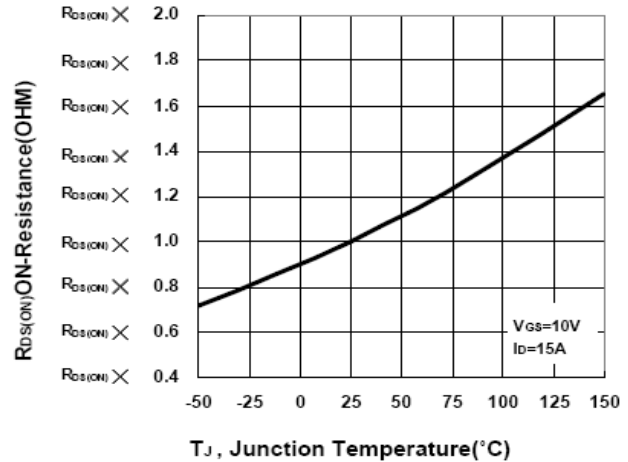
**Capacitance Characteristic**



**Gate charge Characteristics**



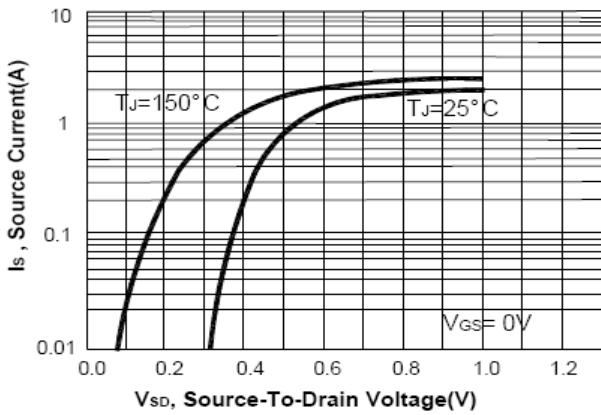
**On-Resistance vs. Junction Temperature**



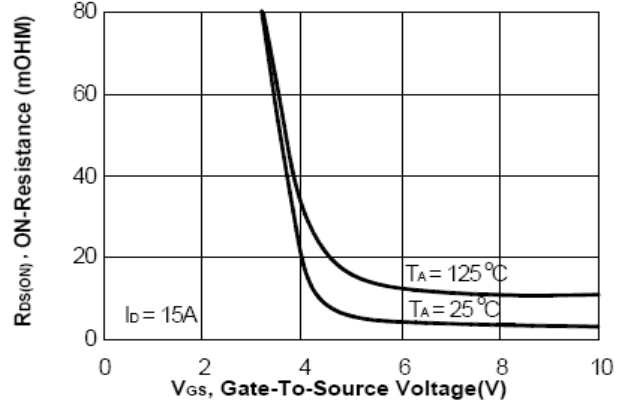
# P1004HV

## N-Channel Enhancement Mode MOSFET

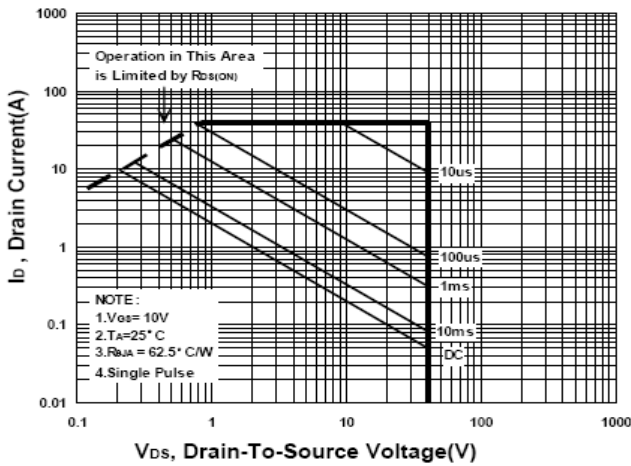
**Body Diode Forward Voltage VS Source current**



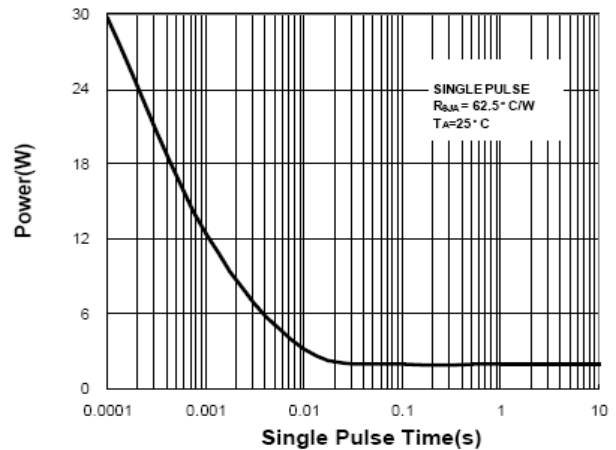
**On-Resistance VS Gate-To-Source**



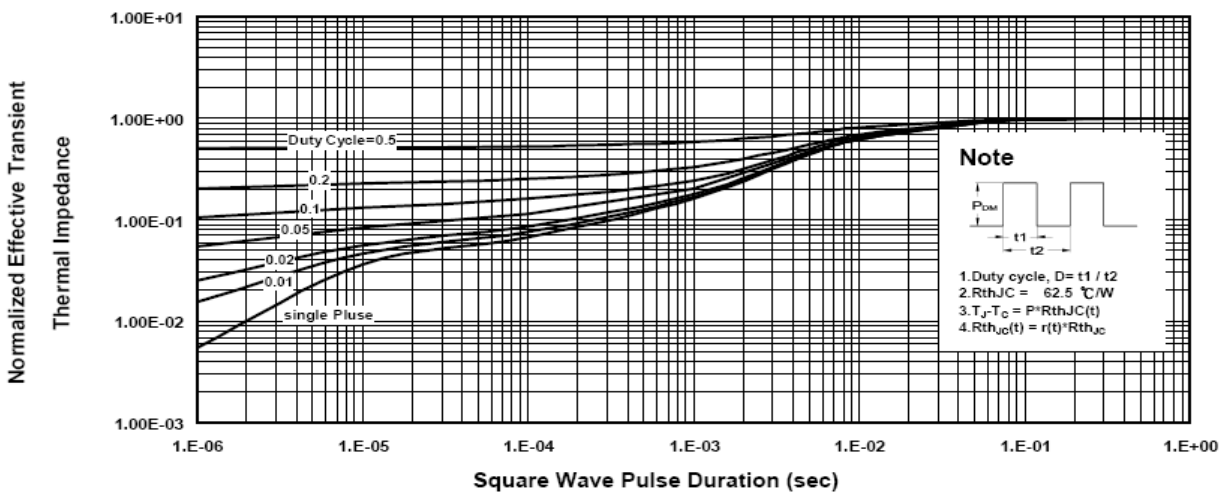
**Safe Operating Area**



**Single Pulse Maximum Power Dissipation**



**Transient Thermal Response Curve**



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## N-Channel Enhancement Mode MOSFET

### Package Dimension

### SOP-8 MECHANICAL DATA

Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	4.8	4.9	5.0	H	0.4	0.6	0.93
B	3.8	3.9	4.0	I	0.19	0.21	0.25
C	5.79	6.0	6.2	J	0.25	0.375	0.5
D	0.33	0.4	0.51	K	0°	3°	18°
E	1.25	1.27	1.29				
F	1.1	1.3	1.65				
G	0.05	0.15	0.25				

