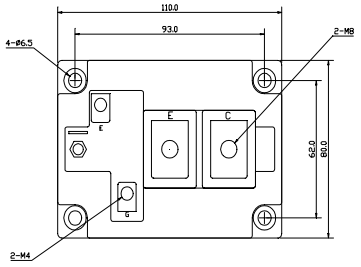
Nihon Inter Electronics Corporation

MOSFET MODULE Single 560A/150V PHM5601

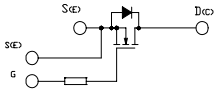
OUTLINE DRAWING

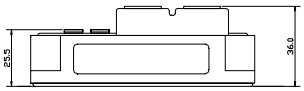


FEATURES

* Trench Gate MOS FET Module
* Super Low Rds(ON) 2 milliohms(@560A)
* With Fast Recovery Source-Drain Diode

Circuit





TYPICAL APPLICATIONS

* Chopper Control For FORKLIFTs

Approximate Weight : 650g

MAXMUM RATINGS

Ratings		Symbol	PHM5601		Unit
Drain-Source Voltage (V_{GS}=0V)		V_{DSS}	150		V
Gate - Source Voltage		V_{GSS}	+/- 20		V
Continuous Drain Current	Duty=50%	I_D	560 (Tc=25°C)		A
	D.C.		440 (Tc=25°C)		
Pulsed Drain Current		I_{DM}	1,120 Tc=25°C)		A
Total Power Dissipation		P_D	1,780 Tc=25°C)		W
Operating Junction Temperature Range		T_{jw}	-40 to +150		°C
Storage Temperature Range		T_{stg}	-40 to +125		°C
Isolation Voltage Terminals to Base AC, 1 min.)		V_{ISO}	2,500		V
Mounting Torque	Module Base to Heatsink	F_{TOR}	3.0		N•m
	Gate Terminals		M4	1.4	
	Bus Bar to Main Terminals		M8	10.5	

ELECTRICAL CHARACTERISTICS (@Tc=25°C unless otherwise noted)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=V_{DSS},V_{GS}=0V	-	-	3.2	mA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=+/- 20V,V_{DS}=0V	-	-	3.2	μA
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=16mA	1.0	2.0	3.2	V
Static Drain-Source On-Resistance	$r_{DS(on)}$	V_{GS}=10V, I_D=560A	-	1.6	2.0	m-ohm
Drain-Source On-Voltage	$V_{DS(on)}$	V_{GS}=10V, I_D=560A	-	1.0	1.2	V
Forward Transconductance	g_{fs}	V_{DS}=15V, I_D=560A	-	-	-	S
Input Capacitance	C_{ies}	V_{DS}=10V,V_{GS}=0V,f=1MHz	-	110	-	nF
Output Capacitance	C_{oss}		-	13	-	nF
Reverse Transfer Capacitance	C_{rss}		-	13	-	nF
Rise Time	t_r	V_{DD}= 80V I_D=280A V_{GS}= -5V, +10V R_G= 1.2 ohm	-	400	-	ns
Turn-On Delay Time	$t_{d(on)}$		-	380	-	
Fall Time	t_f		-	170	-	
Turn-Off Delay Time	$t_{d(off)}$		-	1,100	-	

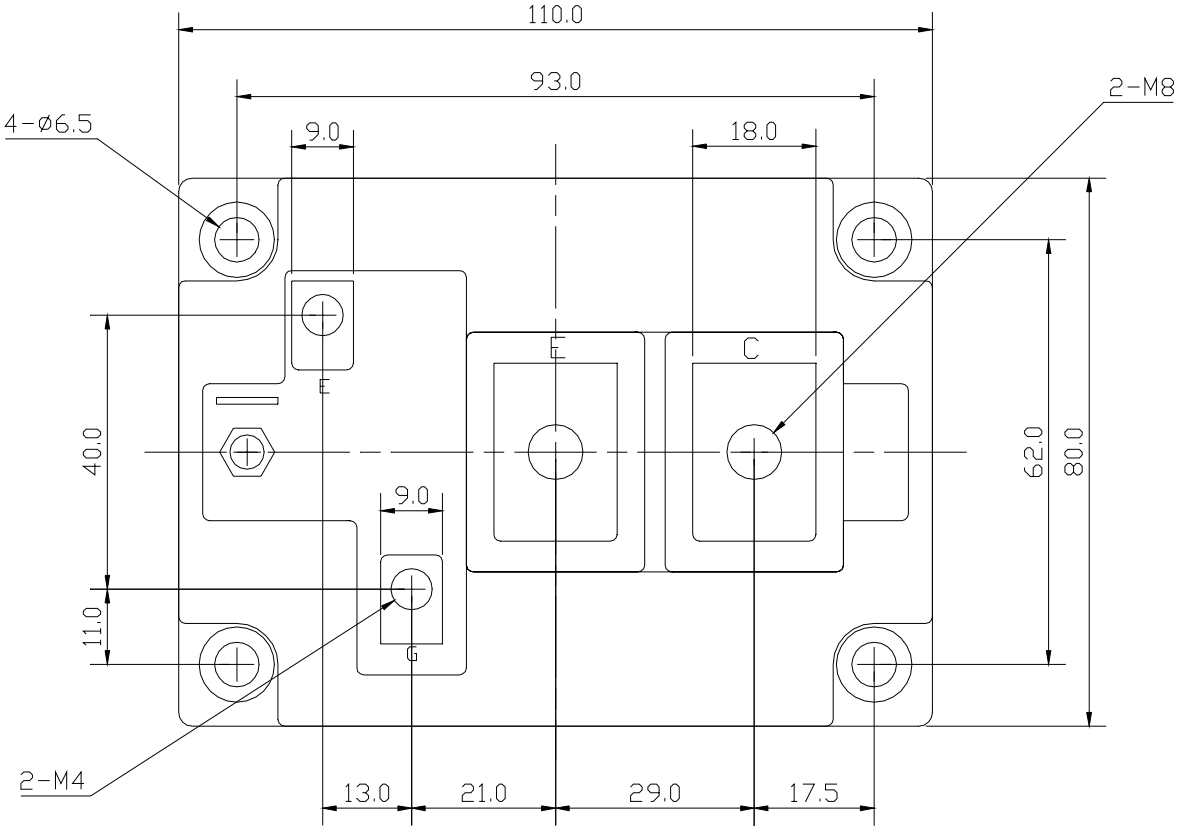
FREE WHEELING DIODES RATINGS & CHARACTERISTICS (Tc=25°C)

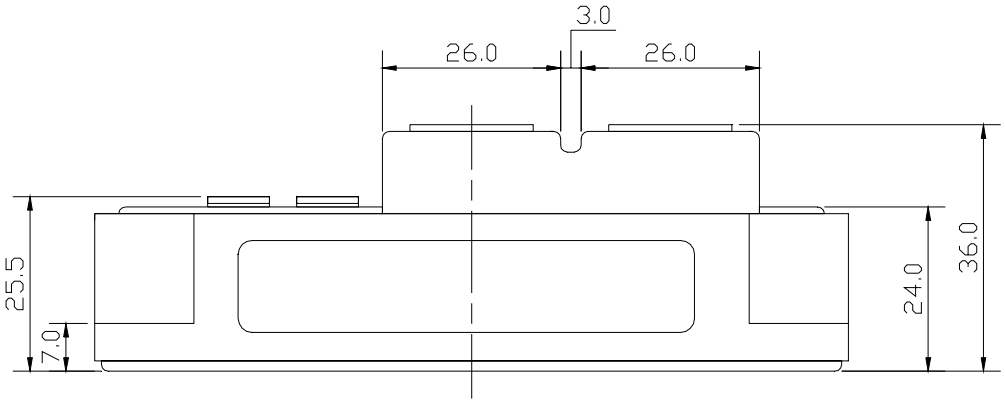
Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Continuous Source Current	I_S	Duty=50%.	-	-	560	A
		D.C. (Terminal Temperature=80°C			450	
Pulsed Source Current	I_{SM}	-	-	-	1,120	A
Diode Forward Voltage	V_{SD}	I_S=560A	-	1.6	2.0	V
Reverse Recovery Time	t_{rr}	I_S=560A, -dis/dt=1,100A/μs	-	130	-	ns

THERMAL CHRACTERISTICS

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Thermal Resistance, Junction to Case	$R_{th(j-c)}$		-	-	0.07	°C/W
Thermal Resistance, Case to Heatsink	$R_{th(c-f)}$	Mounting surface flat, smooth, and greased	-	-	0.035	

PHM5601 OUTLINE DRAWING (Dimensions in mm)





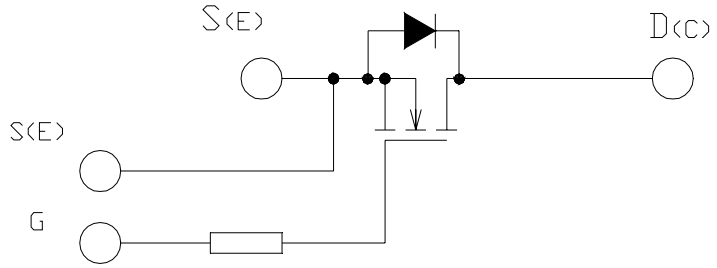


Fig.1- Output Characteristics (Typical)

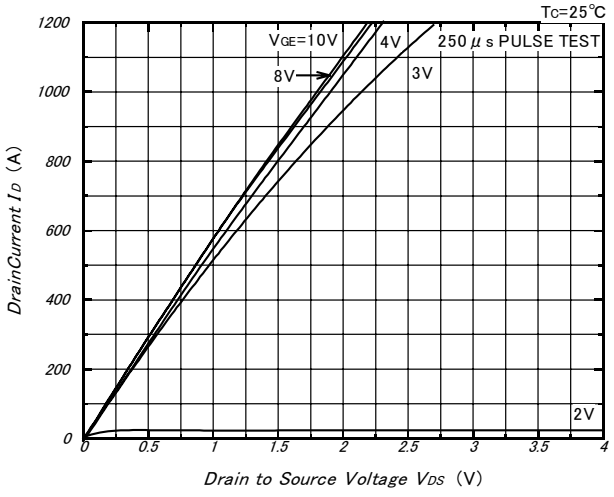


Fig.2- Drain to Source On Voltage vs. Gate to Source Voltage (Typical)

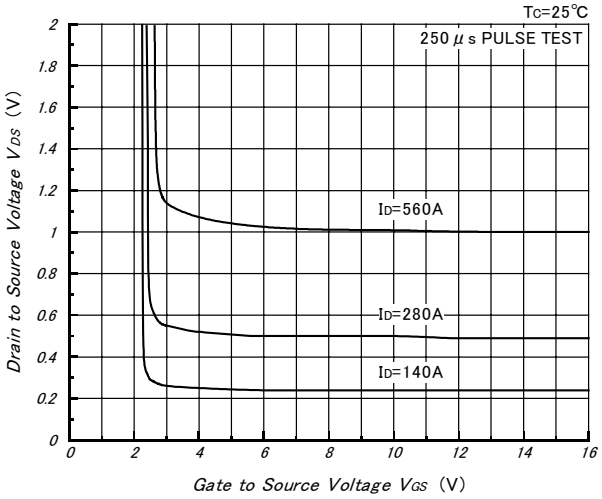


Fig.3- Drain to Source On Voltage vs. Junction Temperature (Typical)

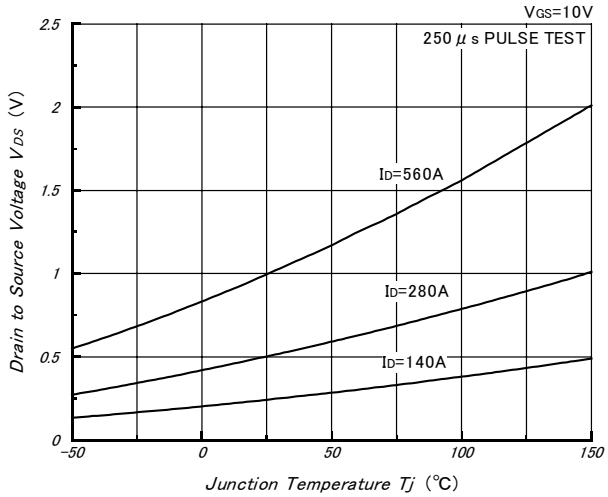


Fig.4- Capacitance vs. Drain to Source Voltage (Typical)

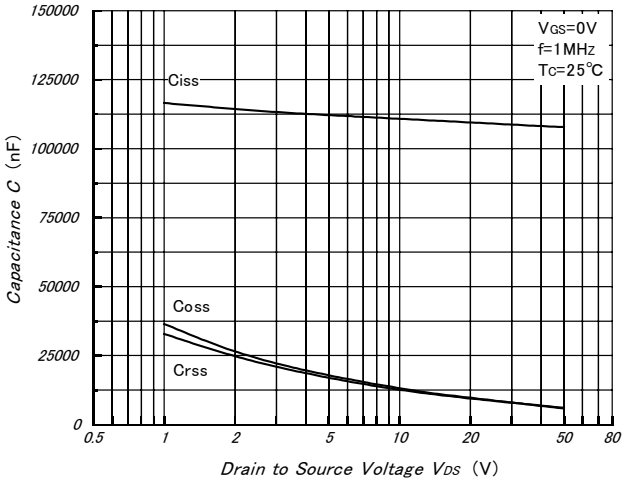


Fig.5- Gate Charge vs. Gate to Source Voltage (Typical)

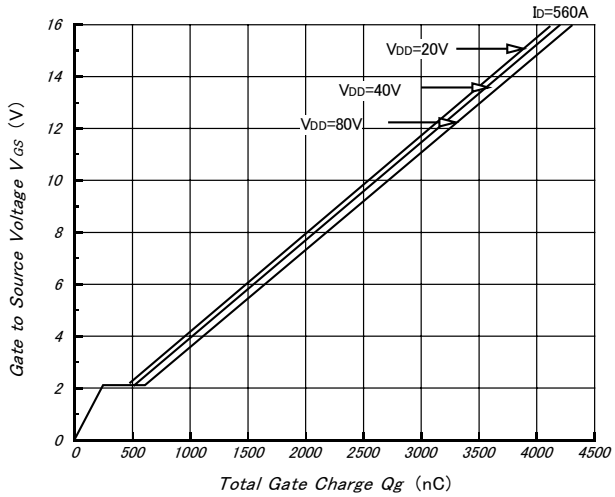


Fig.6- Series Gate Impedance vs. Switching Time (Typical)

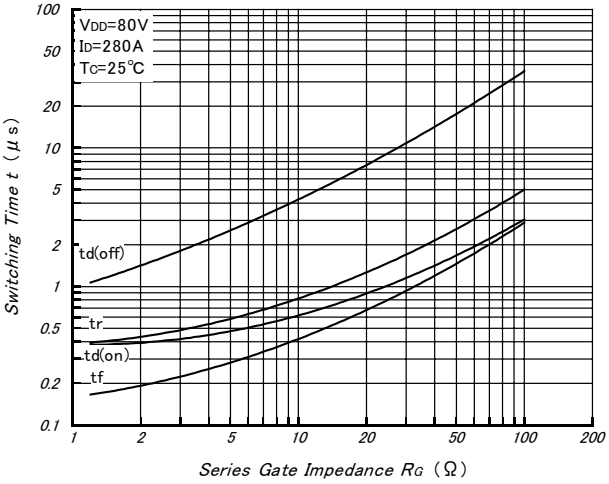


Fig.7- Drain Current vs. Switching Time (Typical)

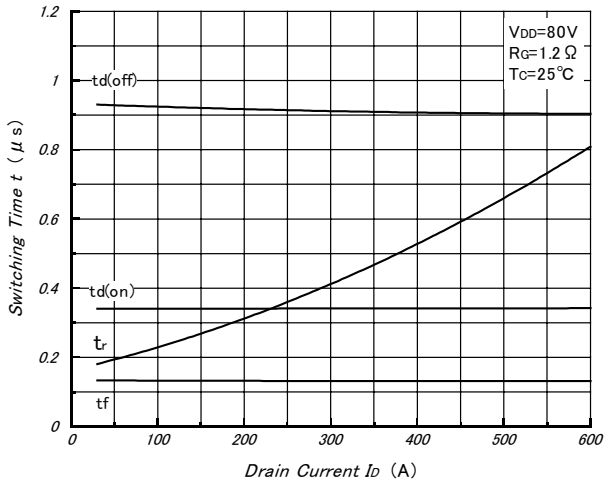


Fig.8- Source to Drain Diode Forward Characteristics (Typical)

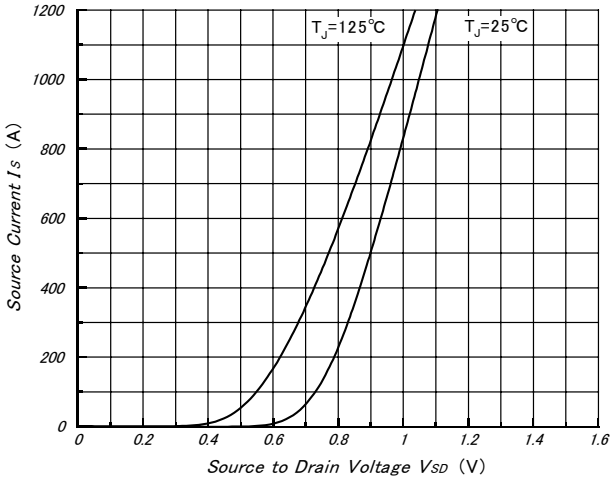


Fig.9- Reverse Recovery Characteristics (Typical)

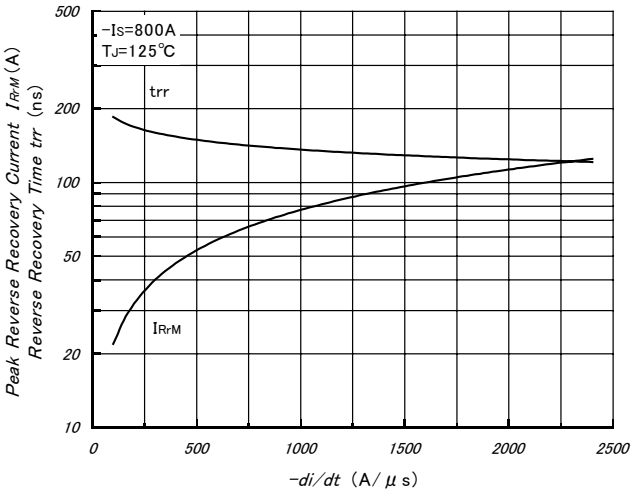


Fig.10- Maximun Transient Thermal Impedance