

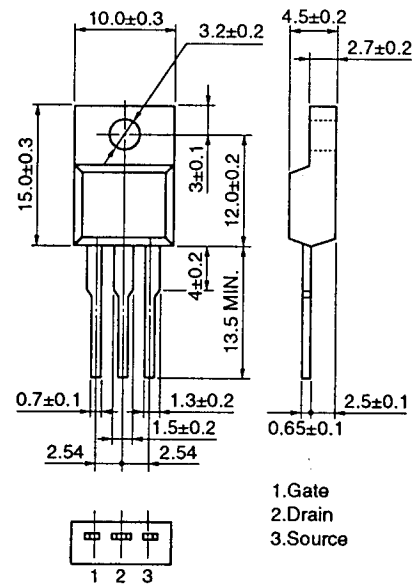
SWITCHING N-CHANNEL POWER MOS FET INDUSTRIAL USE

DESCRIPTION

This product is N-Channel MOS Field Effect Transistor designed for high current switching applications.

FEATURES

- Low On-State Resistance
 $R_{DS(on)1} = 15m\Omega$ Max. (VGS=10V, ID=25A)
 $R_{DS(on)2} = 23m\Omega$ Max. (VGS= 4V, ID=25A)
- Low Ciss Ciss = 2550pF Typ.
- Built-in Gate Protection Diode
- Isolated TO-220 Package

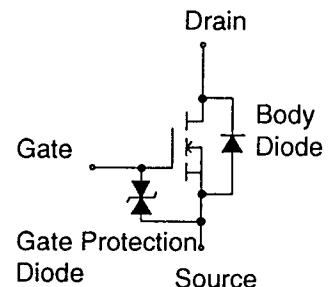


ABSOLUTE MAXIMUM RATINGS(Ta=25°C)

Drain to Source Voltage	V _{DSS}	60	V
Gate to Source Voltage	V _{GSS}	± 20	V
Drain Current(DC)	I _{D(DC)}	± 50	A
Drain Current(pulse)*	I _{D(pulse)}	± 200	A
Total Power Dissipation(T _c =25°C)	P _T	30	W
Total Power Dissipation(T _a =25°C)	P _T	2.0	W
Channel Temperature	T _{ch}	150	°C
Storage Temperature	T _{stg}	-55 to +150	°C

* PW ≤ 10μs, Duty Cycle ≤ 1%

MP-45F (ISOLATED TO-220)



THRML RESISTANCE

Channel to Case	R _{th(ch-c)}	4.17	°C/W
Channel to Ambient	R _{th(ch-a)}	62.5	°C/W

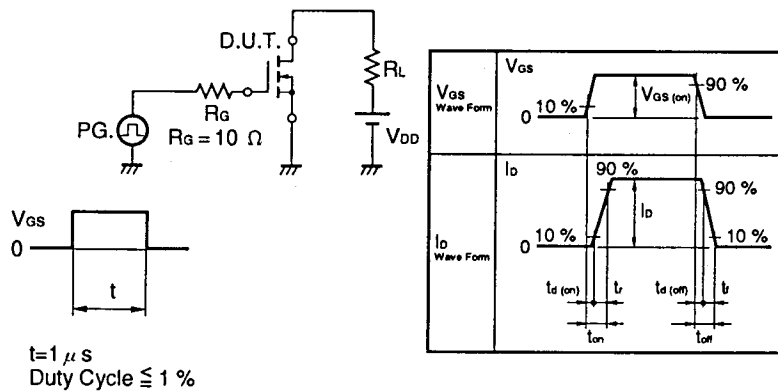
The diode connected between the gate and source of the transistor serves as a protector against ESD. When this device acutally used, an additional protection circiut is externally required if voltage exceeding the rated voltage may be applied to this device.

This information in this document is being issued in advance of the production cycle for the device. The parameter for the device may change before final production or NEC Corporation, at its own discretion, may withdraw the device prior to its production.

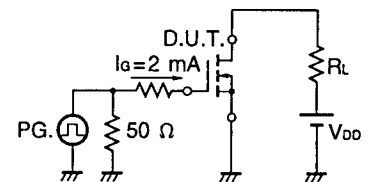
ELECTRICAL CHARACTERISTICS(Ta=25°C)

CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Drain to Source On-state Resistance	$R_{DS(on)1}$	$V_{GS}=10V, I_D=25A$		11	15	mΩ
	$R_{DS(on)2}$	$V_{GS}=4V, I_D=25A$		16	23	mΩ
Gate to Source Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=10V, I_D=1mA$	1.0	1.5	2.0	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=10V, I_D=25A$	15	30		S
Drain Leakage Current	I_{DSS}	$V_{DS}=60V, V_{GS}=0$			10	μA
Gate to Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0$			±10	μA
Input Capacitance	C_{iss}	$V_{DS}=10V$		2550		pF
Output Capacitance	C_{oss}	$V_{GS}=0$		700		pF
Reverse Transfer Capacitance	C_{rss}	$f=1MHz$		250		pF
Turn-On Delay Time	$t_{d(on)}$	$I_D=25A$		30		ns
Rise Time	t_r	$V_{GS(on)}=10V$		400		ns
Turn-Off Delay Time	$t_{d(off)}$	$V_{DD}=30V$		170		ns
Fall Time	t_f	$R_G=10\Omega$		200		ns
Total Gate Charge	Q_G	$I_D=50A$		50		nC
Gate to Source Charge	Q_{GS}	$V_{DD}=48V$		5.0		nC
Gate to Drain Charge	Q_{GD}	$V_{GS(on)}=10V$		15		nC
Body Diode Forward Voltage	$V_{F(S-D)}$	$I_F=50A, V_{GS}=0$		1.0		V
Reverse Recovery Time	t_{rr}	$I_F=50A, V_{GS}=0$		80		ns
Reverse Recovery Charge	Q_{rr}	$di/dt=100A/\mu s$		20		nC

Test Circuit 1 Switching Time



Test Circuit 2 Gate Charge



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Standard: Computers, office equipment, communications equipment, test and measurement equipment, audio and visual equipment, home electronic appliances, machine tools, personal electronic equipment and industrial robots

Special: Transportation equipment (automobiles, trains, ships, etc.), traffic control systems, anti-disaster systems, anti-crime systems, safety equipment and medical equipment (not specifically designed for life support)

Specific: Aircrafts, aerospace equipment, submersible repeaters, nuclear reactor control systems, life support systems or medical equipment for life support, etc.

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Anti-radioactive design is not implemented in this product.