

Silicon N Channel MOS FET

Application

High speed power switching

Features

- Low on-resistance
- High speed switching
- Low drive current
- No secondary breakdown
- Suitable for switching regulator, DC-DC converter

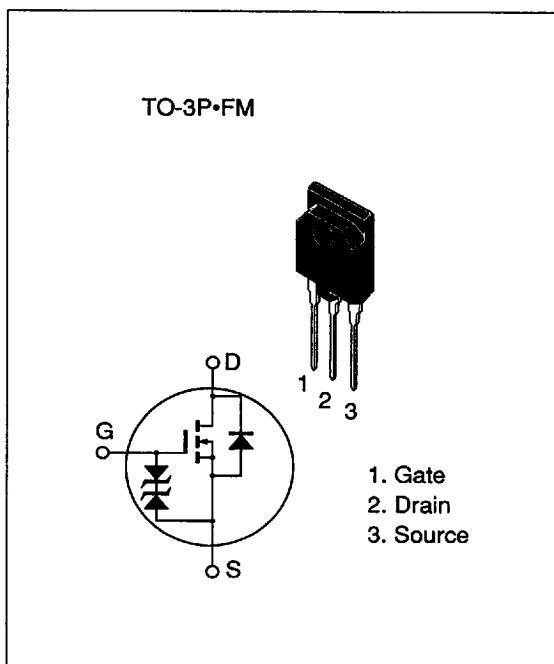


Table 1 Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	800	V
Gate to source voltage	V_{GSS}	± 20	V
Drain current	I_D	7	A
Drain peak current	$I_{D(pulse)}^*$	20	A
Body-drain diode reverse drain current	I_{DR}	7	A
Channel dissipation	P_{ch}^{**}	60	W
Channel temperature	T_{ch}	150	$^\circ\text{C}$
Storage temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

* $PW \leq 10 \mu\text{s}$, duty cycle $\leq 1\%$

** Value at $T_c = 25^\circ\text{C}$

Table 2 Electrical Characteristics (Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	800	—	—	V	$I_D = 10 \text{ mA}$, $V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	± 20	—	—	V	$I_G = \pm 100 \text{ }\mu\text{A}$, $V_{DS} = 0$
Gate to source leak current	I_{GSS}	—	—	± 10	μA	$V_{GS} = \pm 16 \text{ V}$, $V_{DS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	250	μA	$V_{DS} = 640 \text{ V}$, $V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	2.0	—	4.0	V	$I_D = 1 \text{ mA}$, $V_{DS} = 10 \text{ V}$
Static drain to source on state resistance	$R_{DS(on)}$	—	1.0	1.5	Ω	$I_D = 4 \text{ A}$ $V_{GS} = 10 \text{ V}^*$
Forward transfer admittance	$ y_{fs} $	2.5	4.0	—	S	$I_D = 4 \text{ A}$ $V_{DS} = 20 \text{ V}^*$
Input capacitance	C_{iss}	—	1830	—	pF	$V_{DS} = 10 \text{ V}$
Output capacitance	C_{oss}	—	1150	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	C_{rss}	—	730	—	pF	$f = 1 \text{ MHz}$
Turn-on delay time	$t_{d(on)}$	—	20	—	ns	$I_D = 4 \text{ A}$
Rise time	t_r	—	230	—	ns	$V_{GS} = 10 \text{ V}$
Turn-off delay time	$t_{d(off)}$	—	220	—	ns	$R_L = 7.5 \text{ }\Omega$
Fall time	t_f	—	220	—	ns	
Body-drain diode forward voltage	V_{DF}	—	1.0	—	V	$I_F = 7 \text{ A}$, $V_{GS} = 0$
Body-drain diode reverse recovery time	t_{rr}	—	1000	—	ns	$I_F = 7 \text{ A}$, $V_{GS} = 0$, $di_F / dt = 100 \text{ A} / \mu\text{s}$

* Pulse Test

See characteristic curves of 2SK684 except [MAXIMUM SAFE OPERATION AREA] and [NORMALIZED TRANSIENT THERMAL IMPEDANCE VS. PULSE WIDTH]

HITACHI/(OPTOELECTRONICS)

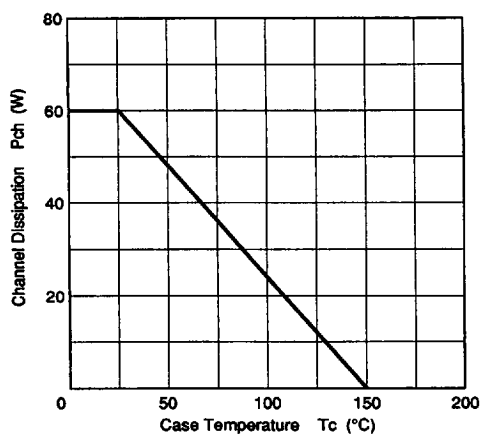


Figure 1 Power vs. Temperature Derating

Package Dimensions

Unit: mm

TO-3P-FM

