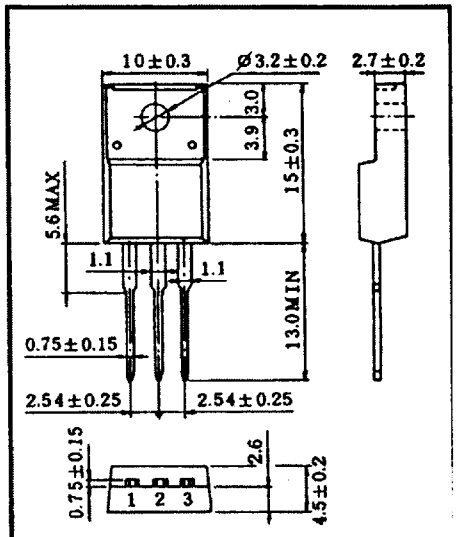
Field Effect Transistor

Silicon N Channel MOS Type (L^2-π-MOS III)

High Speed, High Current DC-DC Converter, Relay Drive and Motor Drive Applications

Industrial Applications **Unit in mm**



1. GATE
2. DRAIN
3. SOURCE

JEDEC	—
EIAJ	SC-67
TOSHIBA	2-10R1B

Weight : 1.9g

Features

- 4-Volt Gate Drive
- Low Drain-Source ON Resistance
  - $R_{DS(ON)}$ = 0.042Ω (Typ.)
- High Forward Transfer Admittance
  - $|Y_{fs}|$ = 11S (Typ.)
- Low Leakage Current
  - I_{DSS} = 100μA (Max.) @ V_{DS} = 60V
- Enhancement-Mode
  - V_{th} = 0.8 ~ 2.0V @ V_{DS} = 10V, I_D = 1mA

Absolute Maximum Ratings (Ta = 25°C)

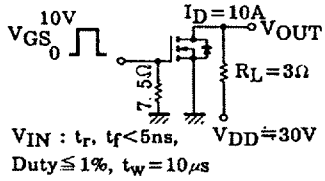
CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DSS}	60	V
Drain-Gate Voltage (R_{GS} = 20kΩ)		V_{DGR}	60	V
Gate-Source Voltage		V_{GSS}	±20	V
Drain Current	DC	I_D	20	A
	Pulse	I_{DP}	80	
Drain Power Dissipation (Ta = 25°C)		P_D	40	W
Channel Temperature		T_{ch}	150	°C
Storage Temperature Range		T_{stg}	-55 ~ 150	°C

Thermal Characteristics

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Case	$R_{th(ch-c)}$	3.125	°C/W
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	62.5	°C/W

This transistor is an electrostatic sensitive device. Please handle with care.

Electrical Characteristics (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V	–	–	±10	nA
Drain Cut-off Current		I_{DSS}	V_{DS} = 60V, V_{GS} = 0V	–	–	100	μA
Drain-Source Breakdown Voltage		$V_{(BR)\ DSS}$	I_D = 10mA, V_{GS} = 0V	60	–	–	V
Gate Threshold Voltage		V_{th}	V_{DS} = 10V, I_D = 1mA	0.8	–	2.0	V
Drain-Source ON Resistance		$R_{DS\ (ON)}$	V_{GS} = 4V, I_D = 5A	–	0.064	0.090	Ω
			V_{GS} = 10V, I_D = 10A	–	0.042	0.055	
Forward Transfer Admittance		$\|Y_{fs}\|$	V_{DS} = 10V, I_D = 10A	6.0	11	–	S
Input Capacitance		C_{iss}	V_{DS} = 10V, V_{GS} = 0V, f = 1MHz	–	1150	1600	pF
Reverse Transfer Capacitance		C_{rss}		–	280	420	
Output Capacitance		C_{oss}		–	780	1100	
Switching Time	Rise Time	t_r		–	18	35	ns
	Turn-on Time	t_{on}		–	30	60	
	Fall Time	t_f		–	30	60	
	Turn-off Time	t_{off}		–	110	220	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Q_g	V_{DD} = 48V, V_{GS} = -10V, I_D = 20A	–	54	100	nC
Gate-Source Charge		Q_{gs}		–	34	–	
Gate-Drain ("Miller") Charge		Q_{gd}		–	20	–	

Source-Drain Diode Ratings and Characteristics (Ta = 25°C)

CHARACTERISTICS	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	I_{DR}	–	–	–	20	A
Pulse Drain Reverse Current	I_{DRP}	–	–	–	80	A
Diode Forward Voltage	V_{DSF}	I_{DR} = 20A, V_{GS} = 0V	–	-1.1	-1.8	V
Reverse Recovery Time	t_{rr}	I_{DR} = 20A, V_{GS} = 0V, dI_{DR}/dt = 50A/μs	–	130	–	ns
Reverse Recovered Charge	Q_{rr}		–	0.26	–	μC