

Field Effect Transistor

Silicon N Channel MOS Type (L²-π-MOS III)

High Speed, High Current DC-DC Converter,

Relay Drive and Motor Drive Applications

Features

- 4-Volt Gate Drive
- Low Drain-Source ON Resistance
 - $R_{DS(ON)} = 0.33\Omega$ (Typ.)
- High Forward Transfer Admittance
 - $|Y_{fs}| = 3.2S$ (Typ.)
- Low Leakage Current
 - $I_{GSS} = \pm 5\mu A$ (Max.) @ $V_{GS} = \pm 16V$
 - $I_{DSS} = 100\mu A$ (Max.) @ $V_{DS} = 120V$
- Enhancement-Mode
 - $V_{th} = -0.8 \sim 2.0V$ @ $V_{DS} = 10V, I_D = 1mA$

Absolute Maximum Ratings (Ta = 25°C)

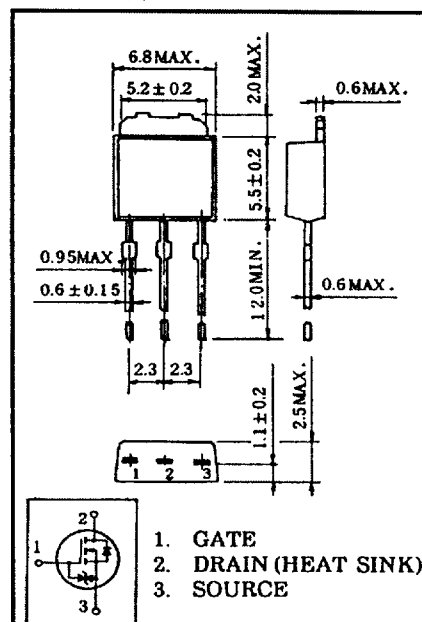
CHARACTERISTIC	SYMBOL	RATING	UNIT
Drain-Source Voltage	V_{DSS}	120	V
Drain-Gate Voltage ($R_{GS} = 20k\Omega$)	V_{DGR}	120	V
Gate-Source Voltage	V_{GSS}	± 20	V
Drain Current	DC	I_D	3
	Pulse	I_{DP}	12
Drain Power Dissipation (Tc = 25°C)	P_D	20	W
Channel Temperature	T_{ch}	150	°C
Storage Temperature Range	T_{stg}	-55 ~ 150	°C

Thermal Characteristics

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Case	$R_{th(ch-c)}$	6.25	°C/W
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	125	°C/W

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

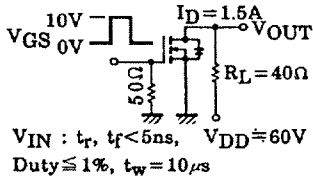
Industrial Applications Unit in mm



JEDEC	—
EIAJ	SC-64
TOSHIBA	2-7B1B

Weight : 0.36g

Electrical Characteristics (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I_{GSS}	$V_{GS} = \pm 16V, V_{DS} = 0V$	—	—	± 5	μA
Drain Cut-off Current		I_{DSS}	$V_{DS} = 60V, V_{GS} = 0V$	—	—	100	μA
Drain-Source Breakdown Voltage		$V_{(BR) DSS}$	$I_D = 10mA, V_{GS} = 0V$	120	—	—	V
Gate Threshold Voltage		V_{th}	$V_{DS} = 10V, I_D = 1mA$	0.8	—	2.0	V
ON State Drain Current		$I_D (ON)$	$V_{DS} = 4V, V_{GS} = 4V$	1.5	—	—	A
Drain-Source ON Resistance		$R_{DS (ON)}$	$V_{GS} = 4V, I_D = 0.8A$	—	0.40	0.60	Ω
			$V_{GS} = 10V, I_D = 1.5A$	—	0.33	0.42	
Forward Transfer Admittance		$ Y_{fs} $	$V_{DS} = 10V, I_D = 1.5A$	2.0	3.2	—	S
Input Capacitance		C_{iss}	$V_{DS} = 10V, V_{GS} = 0V,$ $f = 1MHz$	—	350	500	pF
Reverse Transfer Capacitance		C_{rss}		—	35	55	
Output Capacitance		C_{oss}		—	155	220	
Switching Time	Rise Time	t_r	 $V_{GS} = 10V, 0V$ $I_D = 1.5A$ V_{OUT} 50Ω $R_L = 40\Omega$ $V_{IN} : t_r, t_f < 5ns, V_{DD} = 60V$ $Duty \leq 1\%, t_w = 10\mu s$	—	6	15	ns
	Turn-on Time	t_{on}		—	12	30	
	Fall Time	t_f		—	40	80	
	Turn-off Time	t_{off}		—	100	200	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Q_g	$V_{DD} = 96V, V_{GS} = 10V,$ $I_D = 3A$	—	11	22	nC
Gate-Source Charge		Q_{gs}		—	7	—	
Gate-Drain ("Miller") Charge		Q_{gd}		—	4	—	

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

CHARACTERISTICS	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	I_{DR}	—	—	—	3	A
Pulse Drain Reverse Current	I_{DRP}	—	—	—	12	A
Diode Forward Voltage	V_{DSF}	$I_{DR} = 3A, V_{GS} = 0V$	—	-0.9	-1.5	V
Reverse Recovery Time	t_{rr}	$I_{DR} = 3A, V_{GS} = 0V$	—	130	—	ns
Reverse Recovered Charge	Q_{rr}	$dI_{DR}/dt = 20A/\mu s$	—	0.14	—	μC

