

MOS Field Effect Transistor

KPA1890

■ Features

- Can be driven by a 4.0-V power source

- Low on-state resistance

N-channel $R_{DS(on)1} = 27 \text{ m}\Omega \text{ MAX. (} V_{GS} = 10 \text{ V, } I_D = 3.0 \text{ A)}$

$R_{DS(on)2} = 37 \text{ m}\Omega \text{ MAX. (} V_{GS} = 4.5 \text{ V, } I_D = 3.0 \text{ A)}$

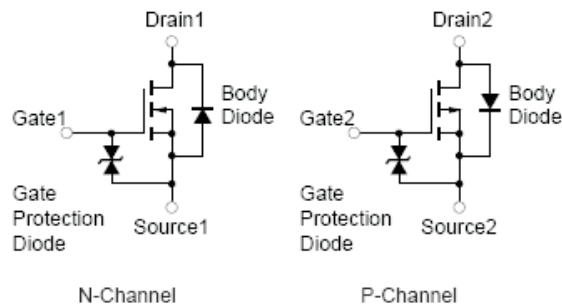
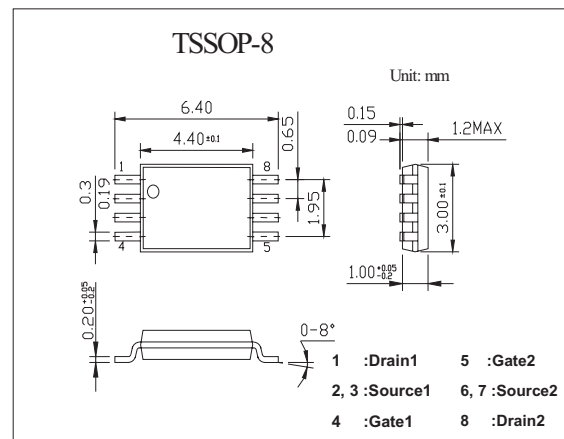
$R_{DS(on)3} = 47 \text{ m}\Omega \text{ MAX. (} V_{GS} = 4.0 \text{ V, } I_D = 3 \text{ A)}$

- P-channel $R_{DS(on)1} = 37 \text{ m}\Omega \text{ MAX. (} V_{GS} = -10 \text{ V, } I_D = -2.5 \text{ A)}$

$R_{DS(on)2} = 56 \text{ m}\Omega \text{ MAX. (} V_{GS} = -4.5 \text{ V, } I_D = -2.5 \text{ A)}$

$R_{DS(on)3} = 64 \text{ m}\Omega \text{ MAX. (} V_{GS} = -4.0 \text{ V, } I_D = -2.5 \text{ A)}$

- Built-in G-S protection diode against ESD

■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

Parameter	Symbol	N-Channel	P-Channel	Unit
Drain to Source Voltage ($V_{GS} = 0 \text{ V}$)	V_{DS}	30	-30	V
Gate to Source Voltage ($V_{DS} = 0 \text{ V}$)	V_{GS}	± 20	± 20	V
Drain Current (DC)	$I_{D(DC)}$	± 6.0	± 5.0	A
Drain Current (pulse) *1	$I_{D(pulse)}$	± 24	± 20	A
Total Power Dissipation *2	P_T	2		W
Channel Temperature	T_{ch}	150		$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to +150		$^\circ\text{C}$

*1 $PW \leq 10 \mu\text{s}$, Duty Cycle $\leq 1\%$

*2 Mounted on ceramic substrate of $5000 \text{ mm}^2 \times 1.1 \text{ mm}$

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■ Electrical Characteristics Ta = 25°C

Parameter	Symbol	Testconditions	Min	Typ	Max	Unit	
Zero Gate Voltage Drain Current	IDSS	VDS = 30 V, VGS = 0 V			10	μ A	
		VDS = -30V, VGS = 0 V			-10		
Gate Leakage Current	IGSS	VGS = ±16 V, VDS = 0 V			±10	μ A	
		VGS = ±16 V, VDS = 0 V			±10		
Gate Cut-off Voltage	VGS(off)	VDS = 10 V, ID = 1 mA		1.5	1.8	2.5	V
		VDS = -10 V, ID = -1 mA		-1.3	-1.8	-2.3	
Forward Transfer Admittance	yfs	VDS = 10 V, ID = 3.0 A		3	7.6		S
		VDS = -10 V, ID = -2.5 A		3	7.8		
Drain to Source On-state Resistance	RDS(on)	RDS(on)1 VGS = 10 V, ID = 3.0 A			18	27	mΩ
		RDS(on)2 VGS = 4.5 V, ID = 3.0 A			24	37	
		RDS(on)3 VGS = 4.0 V, ID = 3.0A			27	47	
		RDS(on)1 VGS = -10 V, ID = -2.5 A			28	37	
		RDS(on)2 VGS = -4.5 V, ID = -2.5 A			42	56	
		RDS(on)3 VGS = -4.0 V, ID = -2.5 A			47	64	
Input Capacitance	Ciss	N-Channel VDS = 10 V, VGS = 0 V, f = 1 MHz	N-Ch		748		pF
			P-Ch		851		
Output Capacitance	Coss	P- Channel VDS = -10 V, VGS = 0 V, f = 1 MHz	N-Ch		227		pF
			P-Ch		279		
Reverse Transfer Capacitance	Crss	VDS = -10 V, VGS = 0 V, f = 1 MHz	N-Ch		107		pF
			P-Ch		128		
Turn-on Delay Time	td(on)	N-Channel VDD = 15 V, ID = 3.0 A, VGS = 10 V RG = 10 Ω	N-Ch		20		ns
			P-Ch		17		
Rise Time	tr	P- Channel VDD = -15 V, ID = -2.5 A, VGS = -10 V RG = 10 Ω	N-Ch		80		ns
			P-Ch		52		
Turn-off Delay Time	td(off)	N-Channel VDD = -15 V, ID = -2.5 A, VGS = -10 V RG = 10 Ω	N-Ch		48		ns
			P-Ch		84		
Fall Time	tr	P- Channel VDD = -15 V, ID = -2.5 A, VGS = -10 V RG = 10 Ω	N-Ch		30		ns
			P-Ch		73		
Total Gate Charge	QG	N-Channel ID = 6.0 A, VDD = 24 V, VGS = 10 V	N-Ch		14		nC
			P-Ch		15		
Gate to Source Charge	QGS	P- Channel ID = -5.0 A, VDD = -24 V, VGS = -10 V	N-Ch		1.9		nC
			P-Ch		1.9		
Gate to Drain Charge	QGD	P- Channel ID = -5.0 A, VDD = -24 V, VGS = -10 V	N-Ch		3.8		nC
			P-Ch		4.2		
Body Diode Forward Voltage Note	VF(S-D)	IF = 6. A, VGS = 0 V	N-Ch		0.82		V
			P-Ch		0.83		
Reverse Recovery Time	trr	N-Channel IF = 6 A, VGS = 0 V, di/dt = 100 A/μ s	N-Ch		31		ns
			P-Ch		38		
Reverse Recovery Charge	Qrr	P- Channel IF = 5 A, VGS = 0 V, di/dt = 100 A/μ s	N-Ch		32		nC
			P-Ch		35		