

MOS Field Effect Transistor

KPA2790GR

■ Features

● Low on-state resistance

N-channel $R_{DS(on)1} = 28 \text{ m}\Omega \text{ MAX. (} V_{GS} = 10 \text{ V, } I_D = 3 \text{ A)}$

$R_{DS(on)2} = 40 \text{ m}\Omega \text{ MAX. (} V_{GS} = 4.5 \text{ V, } I_D = 3 \text{ A)}$

● P-channel $R_{DS(on)1} = 60 \text{ m}\Omega \text{ MAX. (} V_{GS} = -10 \text{ V, } I_D = -3 \text{ A)}$

$R_{DS(on)2} = 80 \text{ m}\Omega \text{ MAX. (} V_{GS} = -4.5 \text{ V, } I_D = -3 \text{ A)}$

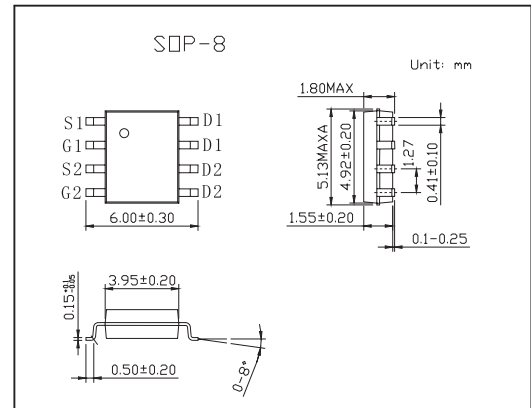
● Low input capacitance

N-channel $C_{iss} = 500 \text{ pF TYP.}$

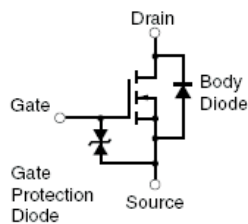
P-channel $C_{iss} = 460 \text{ pF TYP.}$

● Built-in gate protection diode

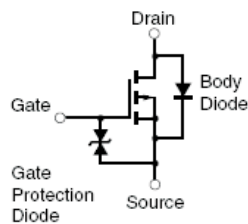
● Small and surface mount package



N-channel



P-channel



■ 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_{DSS}	30	-30	V
Gate to Source Voltage ($V_{DS} = 0 \text{ V}$)	V_{GSS}	± 20	± 20	V
Drain Current (DC)	$I_{D(DC)}$	± 6	± 6	A
Drain Current (pulse) *1	$I_{D(pulse)}$	± 24	± 24	A
Total Power Dissipation (1 unit) *2	P_T	1.7		W
Total Power Dissipation (2 units) *2	P_T	2		W
Channel Temperature	T_{ch}	150		$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to +150		$^\circ\text{C}$
Single Avalanche Current *3	I_{AS}	6	-6	A
Single Avalanche Energy *3	E_{AS}	3.6	3.6	mJ

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

*2 Mounted on ceramic substrate of $2000 \text{ mm}^2 \times 1.6 \text{ mm}$

*3 Starting $T_{ch} = 25^\circ\text{C}$, $V_{DD} = 1/2 \times V_{DSS}$, $R_G = 25 \Omega$, $L = 100 \mu\text{H}$, $V_{GS} = V_{GSS} \rightarrow 0 \text{ V}$

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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	μA
		VDS = -30 V, VGS = 0 V			-10	
Gate Leakage Current	IGSS	VGS = ±16 V, VDS = 0 V			±10	μA
		VGS = ±16 V, VDS = 0 V			±10	
Gate Cut-off Voltage	VGS(off)	VDS = 10 V, ID = 1 mA	1.5		2.5	V
		VDS = -10 V, ID = -1 mA	-1.0		-2.5	
Forward Transfer Admittance	yfs	VDS = 10 V, ID = 3 A	2			S
		VDS = -10 V, ID = -3 A	2			
Drain to Source On-state Resistance	RDS(on)1	VGS = 10 V, ID = 3 A		21	28	mΩ
	RDS(on)2	VGS = 4.5 V, ID = 3 A		28	40	mΩ
	RDS(on)3	VGS = 4.0 V, ID = 3 A		34	53	mΩ
	RDS(on)1	VGS = -10 V, ID = -3 A		43	60	mΩ
	RDS(on)2	VGS = -4.5 V, ID = -3 A		58	80	mΩ
	RDS(on)3	VGS = -4.0 V, ID = -3 A		65	110	mΩ
Input Capacitance	Ciss	N-Channel VDS = 10 V, VGS = 0 V, f = 1 MHz		500		pF
Output Capacitance	Coss	P- Channel		135		pF
Reverse Transfer Capacitance	Crss	VDS = -10 V, VGS = 0 V, f = 1 MHz		130		pF
Turn-on Delay Time	td(on)	N-Channel VDD = 15 V, ID = 3 A, VGS = 10 V		9.2		ns
Rise Time	tr	RG = 10 Ω		8.5		ns
Turn-off Delay Time	td(off)	P- Channel VDD = -15 V, ID = -3 A, VGS = -10 V		8.8		ns
Fall Time	tr	RG = 10 Ω		4.8		ns
Total Gate Charge	QG	N-Channel ID = 6 A, VDD = 24 V, VGS = 10 V		28		ns
Gate to Source Charge	QGS	P- Channel		12.6		nC
Gate to Drain Charge	QGD	ID = -6 A, VDD = -24 V, VGS = -10 V		11		nC
Body Diode Forward Voltage Note	VF(S-D)	IF = 6 A, VGS = 0 V		1.7		V
Reverse Recovery Time	trr	IF = 6 A, VGS = 0 V, di/dt = 100 A/μs		1.7		V
Reverse Recovery Charge	Qrr			0.85		ns
				21		nC
				11		nC
				12		nC