

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

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

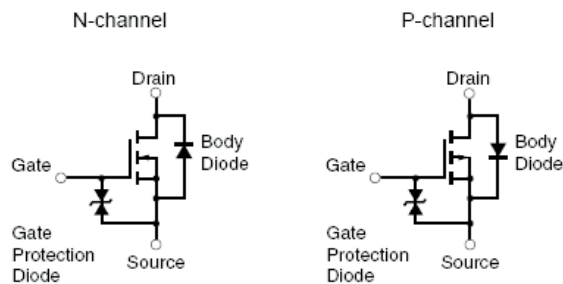
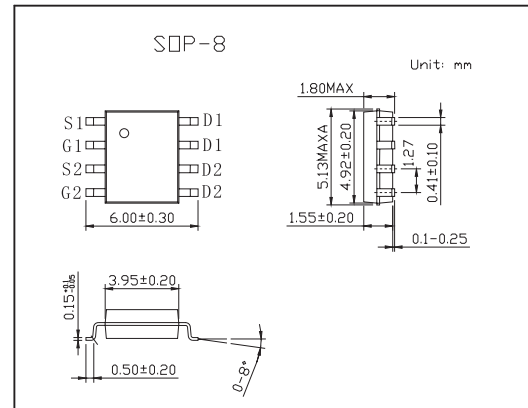
##### ● Low input capacitance

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



#### ■ 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 ( $V_{DS} = 0 \text{ V}$ )	$V_{GSS}$	$\pm 20$	$\pm 20$	V
Drain Current (DC)	$I_{D(DC)}$	$\pm 6$	$\pm 6$	A
Drain Current (pulse) *1	$I_{D(pulse)}$	$\pm 24$	$\pm 24$	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	μ A
		VDS = -30 V, 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	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	m Ω
	RDS(on)2	VGS = 4.5 V, ID = 3 A		28	40	
	RDS(on)3	VGS = 4.0 V, ID = 3 A		34	53	
	RDS(on)1	VGS = -10 V, ID = -3 A		43	60	m Ω
	RDS(on)2	VGS = -4.5 V, ID = -3 A		58	80	
	RDS(on)3	VGS = -4.0 V, ID = -3 A		65	110	
Input Capacitance	Ciss	N-Channel VDS = 10 V, VGS = 0 V, f = 1 MHz	N-Ch	500		pF
			P-Ch	460		
Output Capacitance	Coss	P- Channel VDS = -10 V, VGS = 0 V, f = 1 MHz	N-Ch	135		pF
			P-Ch	130		
Reverse Transfer Capacitance	Crss	VDS = -10 V, VGS = 0 V, f = 1 MHz	N-Ch	77		pF
			P-Ch	77		
Turn-on Delay Time	td(on)	N-Channel VDD = 15 V, ID = 3 A, VGS = 10 V RG = 10 Ω	N-Ch	9.2		ns
			P-Ch	8.5		
Rise Time	tr	P- Channel VDD = -15 V, ID = -3 A, VGS = -10 V RG = 10 Ω	N-Ch	8.8		ns
			P-Ch	4.8		
Turn-off Delay Time	td(off)	N-Channel VDD = 15 V, ID = 3 A, VGS = 10 V RG = 10 Ω	N-Ch	28		ns
			P-Ch	42		
Fall Time	tr	P- Channel VDD = -15 V, ID = -3 A, VGS = -10 V RG = 10 Ω	N-Ch	7.4		ns
			P-Ch	19		
Total Gate Charge	QG	N-Channel ID = 6 A, VDD = 24 V, VGS = 10 V	N-Ch	12.6		nC
			P-Ch	11		
Gate to Source Charge	QGS	P- Channel ID = -6 A, VDD = -24 V, VGS = -10 V	N-Ch	1.7		nC
			P-Ch	1.7		
Gate to Drain Charge	QGD	N-Channel ID = 6 A, VDD = 24 V, VGS = 10 V	N-Ch	3.8		nC
			P-Ch	3.3		
Body Diode Forward Voltage Note	VF(S-D)	IF = 6 A, VGS = 0 V	N-Ch	0.85		V
			P-Ch	0.92		
Reverse Recovery Time	trr	IF = 6 A, VGS = 0 V, di/dt = 100 A/μs	N-Ch	18		ns
			P-Ch	21		
Reverse Recovery Charge	Qrr	IF = 6 A, VGS = 0 V, di/dt = 100 A/μs	N-Ch	11		nC
			P-Ch	12		