PRELIMINARY PRODUCT INFORMATION

NEC

MOS FIELD EFFECT TRANSISTOR

μPA2754GR

SWITCHING
N-CHANNEL POWER MOS FET

DESCRIPTION

The μPA2754GR is Dual N-Channel MOS Field Effect Transistor designed for Li-ion battery protection circuit and power management application.

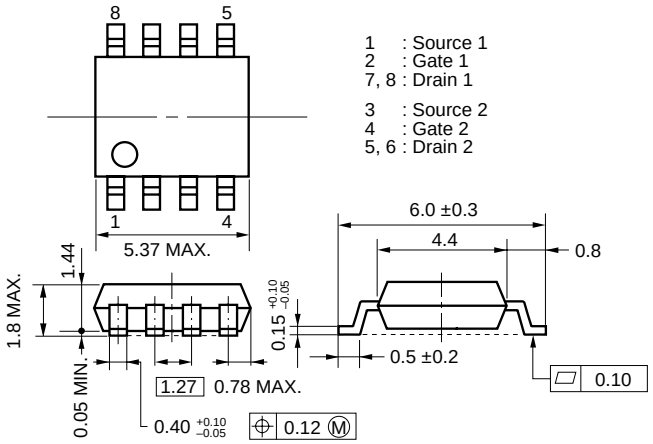
FEATURES

- Dual chip type
- Low on-state resistance
  $R_{DS(on)1}$ = 14.5 mΩ MAX. (V_{GS} = 4.5 V, I_D = 5.5 A)
  $R_{DS(on)2}$ = 15.0 mΩ MAX. (V_{GS} = 4.0 V, I_D = 5.5 A)
  $R_{DS(on)4}$ = 18.6 mΩ MAX. (V_{GS} = 2.5 V, I_D = 5.5 A)
- Low C_{iss}: C_{iss} = 1940 pF TYP. (V_{DS} = 10 V, V_{GS} = 0 V)
- Built-in G-S protection diode
- Small and surface mount package (Power SOP8)

ORDERING INFORMATION

PART NUMBER	PACKAGE
μPA2754GR	Power SOP8

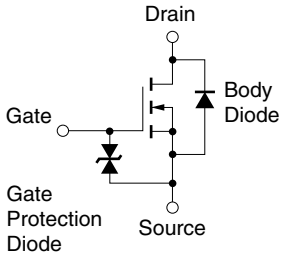
PACKAGE DRAWING (Unit : mm)



ABSOLUTE MAXIMUM RATINGS (T_A = 25°C, All terminals are connected.)

Drain to Source Voltage (V_{GS} = 0 V)	V_{DSS}	30	V
Gate to Source Voltage (V_{DS} = 0 V)	V_{GSS}	±12	V
Drain Current (DC) Note2	$I_{D(DC)}$	±11	A
Drain Current (pulse) Note1	$I_{D(pulse)}$	±88	A
Total Power Dissipation (2 units) Note2	P_T	2.0	W
Total Power Dissipation (1 unit) Note2	P_T	1.7	W
Channel Temperature	T_{ch}	150	°C
Storage Temperature	T_{stg}	–55 to + 150	°C
Single Avalanche Current Note3	I_{AS}	9.0	A
Single Avalanche Energy Note3	E_{AS}	8.1	mJ

EQUIVALENT CIRCUIT
(1/2 circuit)



Notes 1. PW ≤ 10 μs, Duty cycle ≤ 1%
2. T_A = 25°C, Mounted on ceramic substrate of 2000 mm² x 1.6 mm
3. Starting T_{ch} = 25°C, V_{DD} = 15 V, R_G = 25 Ω, V_{GS} = 20 → 0 V

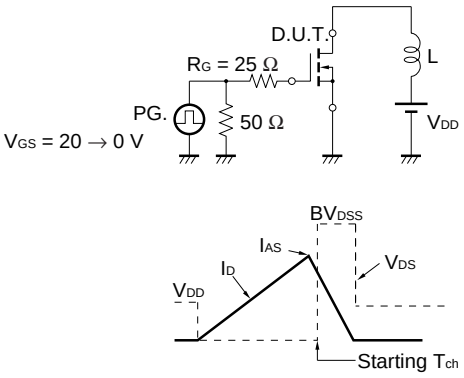
Remark The diode connected between the gate and source of the transistor serves as a protector against ESD. When this device actually used, an additional protection circuit is externally required if a voltage exceeding the rated voltage may be applied to this device.

Document No. G15816EJ1V0PM00 (1st edition)
Date Published November 2001 NS CP(K)
Printed in Japan

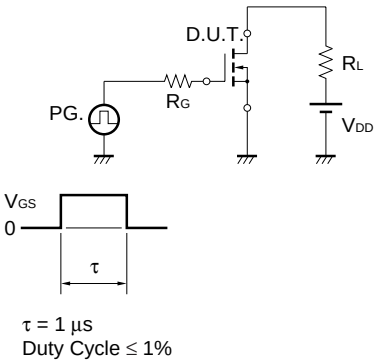
ELECTRICAL CHARACTERISTICS (T_A = 25°C, All terminals are connected.)

CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 30 V, V_{GS} = 0 V			1	μA
Gate Leakage Current	I_{GSS}	V_{GS} = ±12 V, V_{DS} = 0 V			±10	μA
Gate Cut-off Voltage	$V_{GS(off)}$	V_{DS} = 10 V, I_D = 1 mA	0.5	1.0	1.5	V
Forward Transfer Admittance	$\|y_{fs}\|$	V_{DS} = 10 V, I_D = 5.5 A	8	16		S
Drain to Source On-state Resistance	$R_{DS(on)1}$	V_{GS} = 4.5 V, I_D = 5.5 A		11.5	14.5	mΩ
	$R_{DS(on)2}$	V_{GS} = 4.0 V, I_D = 5.5 A		11.8	15.0	mΩ
	$R_{DS(on)3}$	V_{GS} = 3.1 V, I_D = 5.5 A		12.7	16.9	mΩ
	$R_{DS(on)4}$	V_{GS} = 2.5 V, I_D = 5.5 A		13.9	18.6	mΩ
Input Capacitance	C_{iss}	V_{DS} = 10 V		1940		pF
Output Capacitance	C_{oss}	V_{GS} = 0 V		385		pF
Reverse Transfer Capacitance	C_{rss}	f = 1 MHz		270		pF
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = 15 V, I_D = 5.5 A		21		ns
Rise Time	t_r	V_{GS} = 4.5 V		45		ns
Turn-off Delay Time	$t_{d(off)}$	R_G = 10 Ω		75		ns
Fall Time	t_f			30		ns
Total Gate Charge	Q_G	V_{DD} = 24 V		25		nC
Gate to Source Charge	Q_{GS}	V_{GS} = 4.5 V		3		nC
Gate to Drain Charge	Q_{GD}	I_D = 11 A		10		nC
Body Diode Forward Voltage	$V_{F(S-D)}$	I_F = 11 A, V_{GS} = 0 V		0.81	1.2	V
Reverse Recovery Time	t_{rr}	I_F = 11 A, V_{GS} = 0 V		47		ns
Reverse Recovery Charge	Q_{rr}	di/dt = 100 A/μs		41		nC

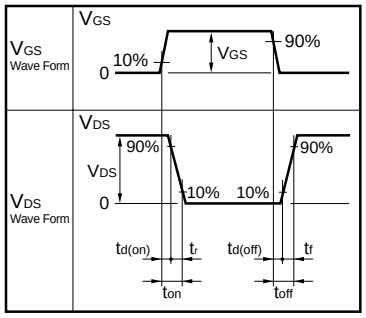
TEST CIRCUIT 1 AVALANCHE CAPABILITY



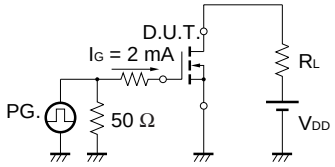
TEST CIRCUIT 2 SWITCHING TIME



τ = 1 μs
Duty Cycle ≤ 1%



TEST CIRCUIT 3 GATE CHARGE



[MEMO]

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