

# G3401

## P-CHANNEL ENHANCEMENT MODE POWER MOSFET

BV <sub>DSS</sub>	-30V
R <sub>DS(ON)</sub>	50mΩ
I <sub>D</sub>	-4.2A

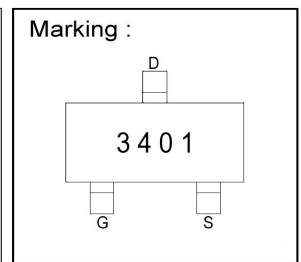
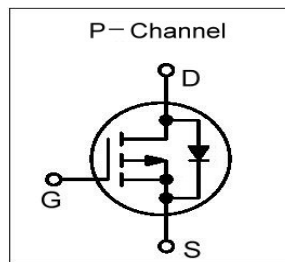
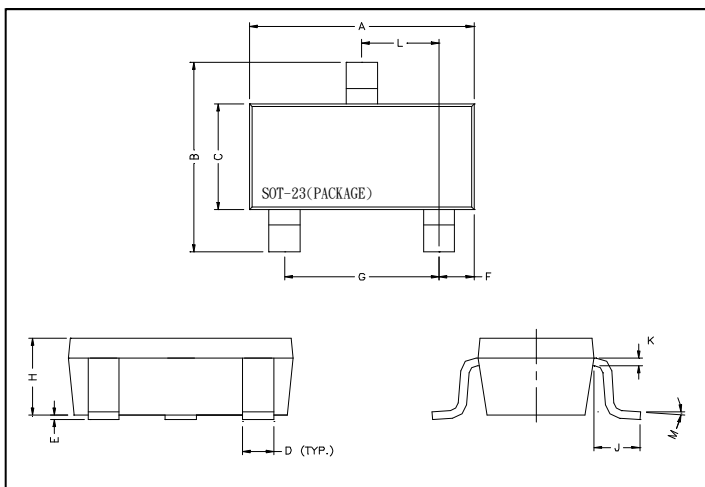
### Description

The G3401 uses advanced trench technology to provide excellent on-resistance extremely efficient and cost-effectiveness device.  
The G3401 is universally used for all commercial-industrial applications.

### Features

- \*Lower Gate Charge
- \*Small Package Outline
- \*RoHS Compliant

### Package Dimensions



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	2.70	3.10	G	1.90	REF.
B	2.40	2.80	H	1.00	1.30
C	1.40	1.60	K	0.10	0.20
D	0.35	0.50	J	0.40	-
E	0	0.10	L	0.85	1.15
F	0.45	0.55	M	0°	10°

### Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V <sub>DS</sub>	-30	V
Gate-Source Voltage	V <sub>GS</sub>	±12	V
Continuous Drain Current <sup>3</sup>	I <sub>D</sub> @TA=25°C	-4.2	A
Continuous Drain Current <sup>3</sup>	I <sub>D</sub> @TA=70°C	-3.5	A
Pulsed Drain Current <sup>1</sup>	I <sub>DM</sub>	-30	A
Power Dissipation	P <sub>D</sub> @TA=25°C	1.38	W
Linear Derating Factor		0.01	W/°C
Operating Junction and Storage Temperature Range	T <sub>j</sub> , T <sub>stg</sub>	-55 ~ +150	°C

### Thermal Data

Parameter	Symbol	Ratings	Unit
Thermal Resistance Junction-ambient <sup>3</sup> Max.	R <sub>thj-a</sub>	90	°C/W

## Electrical Characteristics (T<sub>j</sub> = 25°C unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	-30	-	-	V	V <sub>GS</sub> =0, I <sub>D</sub> =-250uA
Gate Threshold Voltage	V <sub>GS(th)</sub>	-0.7	-	-1.3	V	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250uA
Forward Transconductance	g <sub>fs</sub>	-	11	-	S	V <sub>DS</sub> =-5V, I <sub>D</sub> =-5A
Gate-Source Leakage Current	I <sub>GSS</sub>	-	-	±100	nA	V <sub>GS</sub> = ±12V
Drain-Source Leakage Current(T <sub>j</sub> =25°C)	I <sub>DSS</sub>	-	-	-1	uA	V <sub>DS</sub> =-24V, V <sub>GS</sub> =0
Drain-Source Leakage Current(T <sub>j</sub> =55°C)		-	-	-5	uA	V <sub>DS</sub> =-24V, V <sub>GS</sub> =0
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	-	-	50	mΩ	V <sub>GS</sub> =-10V, I <sub>D</sub> =-4.2A
		-	-	65		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-4.0A
		-	-	120		V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-1.0A
Total Gate Charge <sup>2</sup>	Q <sub>g</sub>	-	9.4	-	nC	I <sub>D</sub> =-4A V <sub>DS</sub> =-15V V <sub>GS</sub> =-4.5V
Gate-Source Charge	Q <sub>gs</sub>	-	2	-		
Gate-Drain ("Miller") Charge	Q <sub>gd</sub>	-	3	-		
Turn-on Delay Time <sup>2</sup>	T <sub>d(on)</sub>	-	6.3	-	ns	V <sub>DS</sub> =-15V V <sub>GS</sub> =-10V R <sub>G</sub> =6Ω R <sub>L</sub> =3.6Ω
Rise Time	T <sub>r</sub>	-	3.2	-		
Turn-off Delay Time	T <sub>d(off)</sub>	-	38.2	-		
Fall Time	T <sub>f</sub>	-	12	-		
Input Capacitance	C <sub>iss</sub>	-	954	-	pF	V <sub>GS</sub> =0V V <sub>DS</sub> =-15V f=1.0MHz
Output Capacitance	C <sub>oss</sub>	-	115	-		
Reverse Transfer Capacitance	C <sub>rss</sub>	-	77	-		
Gate Resistance	R <sub>g</sub>	-	6	-		

## Source-Drain Diode

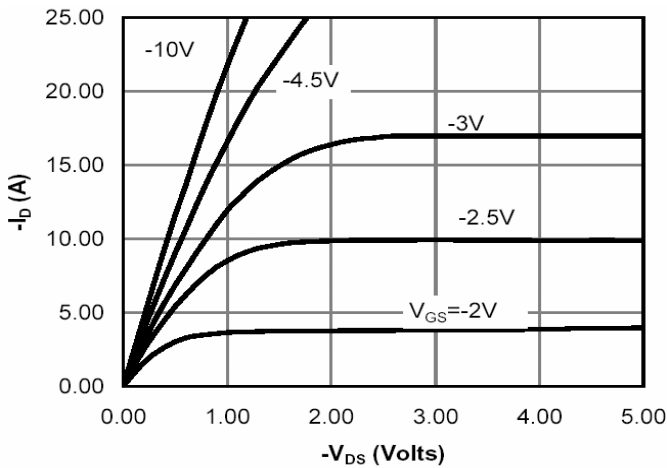
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Forward On Voltage <sup>2</sup>	V <sub>SD</sub>	-	-	-1.0	V	I <sub>S</sub> =-1.0A, V <sub>GS</sub> =0V
Reverse Recovery Time <sup>2</sup>	T <sub>rr</sub>	-	20.2	-	ns	I <sub>S</sub> =-4A, V <sub>GS</sub> =0V di/dt=100A/μs
Reverse Recovery Charge	Q <sub>rr</sub>	-	11.2	-	nC	
Continuous Source Current (Body Diode)	I <sub>S</sub>	-	-	-2.2	A	V <sub>D</sub> =V <sub>G</sub> =0V, V <sub>S</sub> =-1.0V

Notes: 1. Pulse width limited by Max. junction temperature.

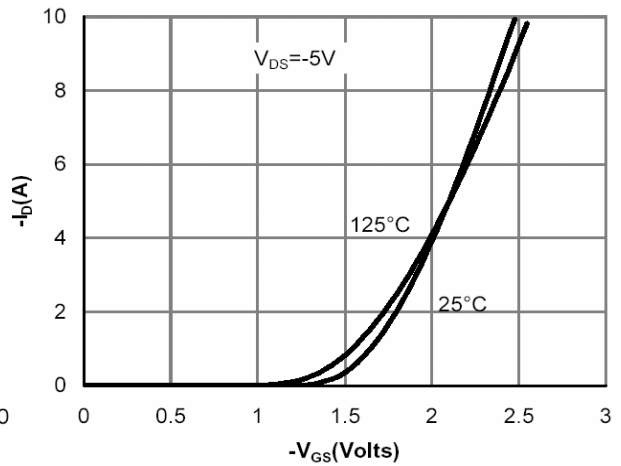
2. Pulse width ≤ 300us, duty cycle ≤ 2%.

3. Surface mounted on 1 in<sup>2</sup> copper pad of FR4 board; 270°C/W when mounted on Min. copper pad.

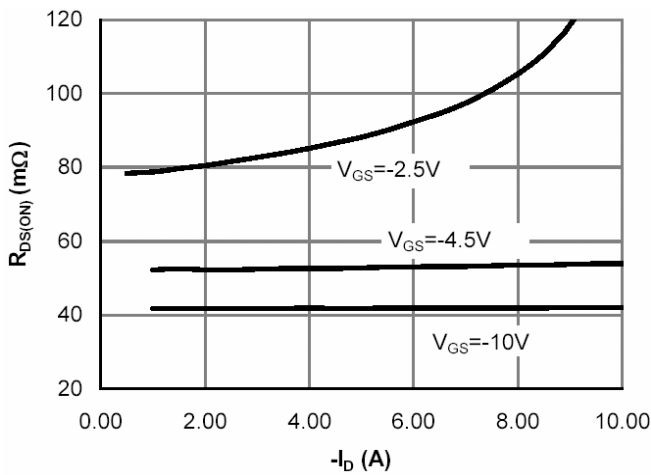
## Characteristics Curve



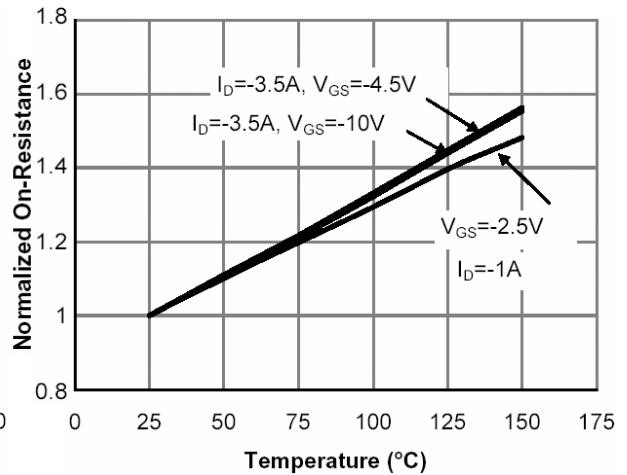
**Fig 1. Typical Output Characteristics**



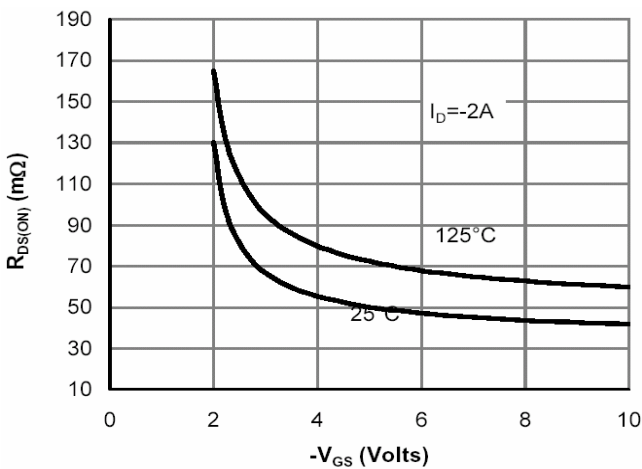
**Fig 2. Transfer Characteristics**



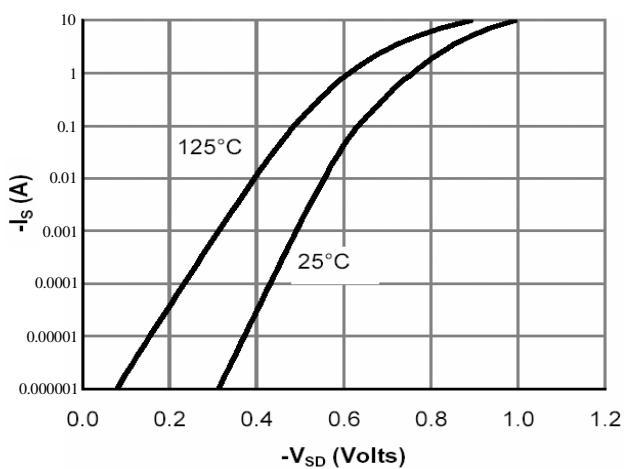
**Fig 3. On-Resistance v.s. Drain Current and Gate Voltage**



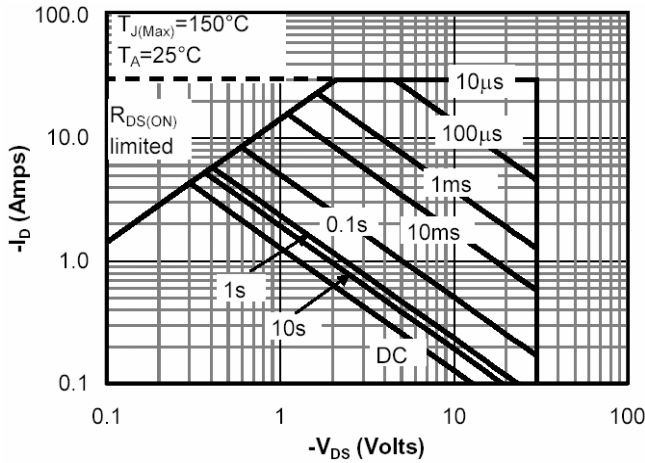
**Fig 4. On-Resistance v.s. Junction Temperature**



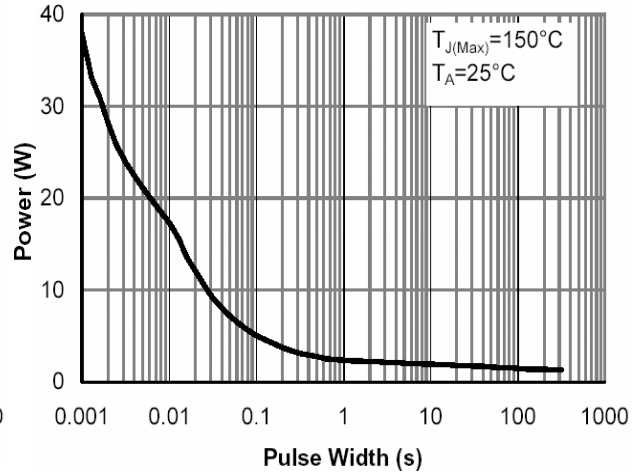
**Fig 5. On-Resistance v.s. Gate-Source Voltage**



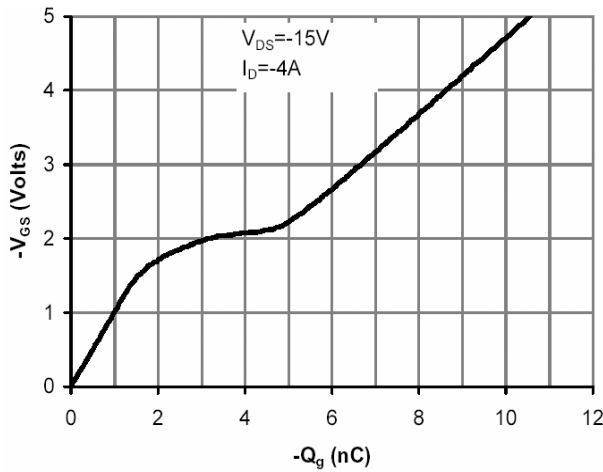
**Fig 6. Body Diode Characteristics**



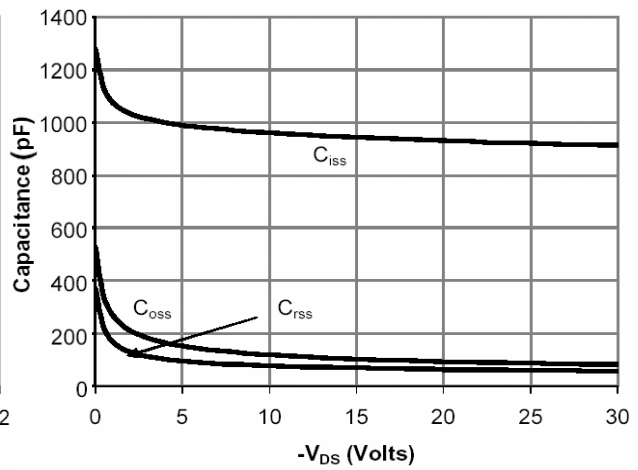
**Fig 7. Maximum Safe Operating Area**



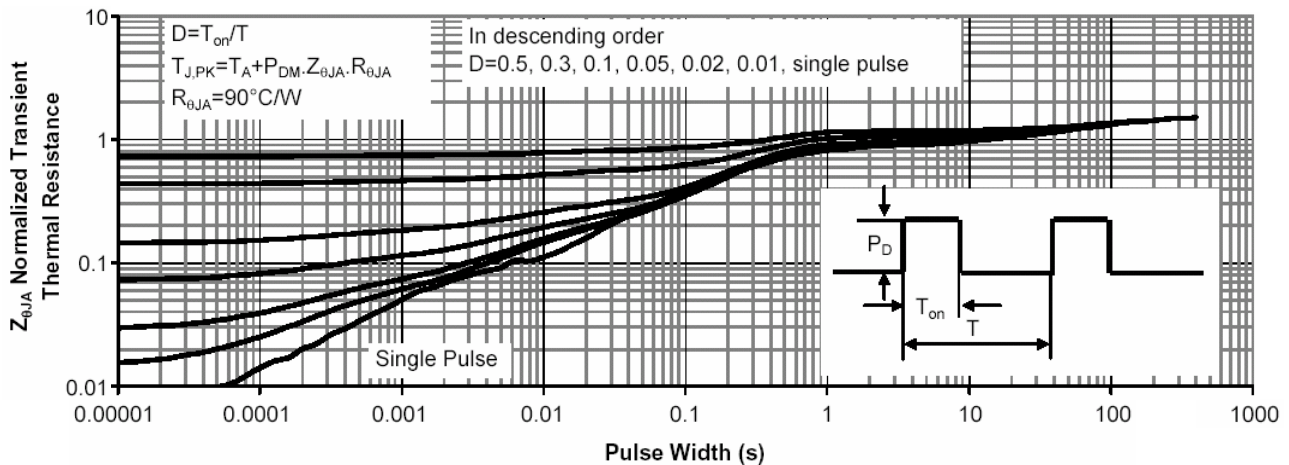
**Fig 8. Single Pulse Power Rating Junction-to-Ambient**



**Fig 9. Gate Charge Characteristics**



**Fig 10. Typical Capacitance Characteristics**



**Fig 11. Normalized Maximum Transient Thermal Impedance**

**Important Notice:**

- All rights are reserved. Reproduction in whole or in part is prohibited without the prior written approval of GTM.
- GTM reserves the right to make changes to its products without notice.
- GTM semiconductor products are not warranted to be suitable for use in life-support Applications, or systems.
- GTM assumes no liability for any consequence of customer product design, infringement of patents, or application assistance.

**Head Office And Factory:**

- **Taiwan:** No. 17-1 Tatung Rd. Fu Kou Hsin-Chu Industrial Park, Hsin-Chu, Taiwan, R. O. C.
- **TEL:** 886-3-597-7061 **FAX:** 886-3-597-9220, 597-0785
- **China:** (201203) No.255, Jang-Jiang Tsai-Lueng RD. , Pu-Dung-Hsin District, Shang-Hai City, China
- **TEL:** 86-21-5895-7671 ~ 4 **FAX:** 86-21-38950165