

## GTT6405

### P-CHANNEL ENHANCEMENT MODE POWER MOSFET

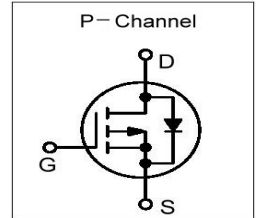
BV <sub>DSS</sub>	-30V
R <sub>DS(ON)</sub>	52mΩ
I <sub>D</sub>	-5.0A

#### Description

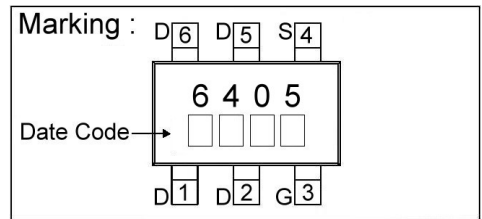
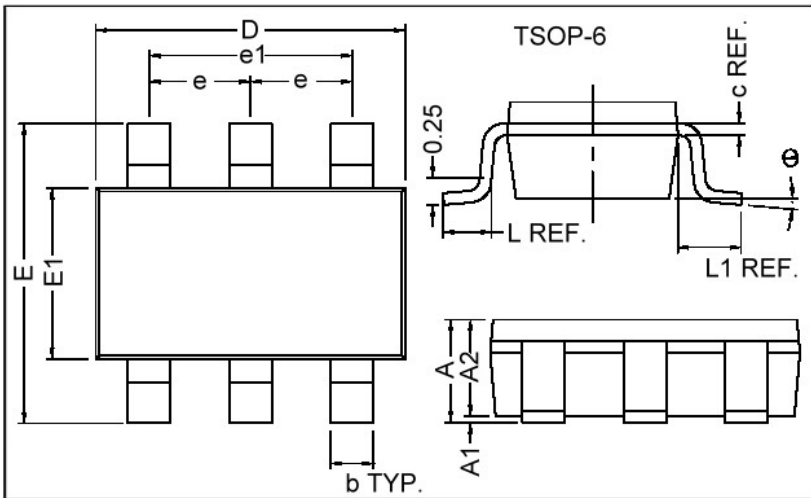
The GTT6405 uses advanced trench technology to provide excellent on-resistance with low gate charge. The device is suitable for use as a load switch or in PWM applications.

#### Features

- \*Lower Gate Charge
- \*RoHS Compliant
- \*Small Footprint & Low Profile Package



#### Package Dimensions



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	1.10 MAX.		L	0.45 REF.	
A1	0	0.10	L1	0.60 REF.	
A2	0.70	1.00	θ	0°	10°
c	0.12 REF.		b	0.30	0.50
D	2.70	3.10	e	0.95 REF.	
E	2.60	3.00	e1	1.90 REF.	
E1	1.40	1.80			

#### Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V <sub>DS</sub>	-30	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Continuous Drain Current <sup>3</sup>	I <sub>D</sub> @TA=25°C	-5.0	A
Continuous Drain Current <sup>3</sup>	I <sub>D</sub> @TA=70°C	-4.2	A
Pulsed Drain Current <sup>1</sup>	I <sub>DM</sub>	-20	A
Power Dissipation	P <sub>D</sub> @TA=25°C	2	W
Linear Derating Factor		0.016	W/°C
Operating Junction and Storage Temperature Range	T <sub>j</sub> , T <sub>stg</sub>	-55 ~ +150	°C

#### Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance Junction-ambient <sup>3</sup> Max.	R <sub>thj-a</sub>	62.5	°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>	-1.0	-	-3.0	V	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250uA
Forward Transconductance	g <sub>fs</sub>	-	8.6	-	S	V <sub>DS</sub> =-5V, I <sub>D</sub> =-5.0A
Gate-Source Leakage Current	I <sub>GSS</sub>	-	-	±100	nA	V <sub>GS</sub> = ±20V
Drain-Source Leakage Current(T <sub>j</sub> =25°C)	I <sub>DSS</sub>	-	-	-1	uA	V <sub>DS</sub> =-30V, 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 <sup>2</sup>	R <sub>DS(on)</sub>	-	-	52	mΩ	V <sub>GS</sub> =-10V, I <sub>D</sub> =-5.0A
		-	-	87		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-4.0A
Total Gate Charge <sup>2</sup>	Q <sub>g</sub>	-	14.7	18	nC	I <sub>D</sub> =-5.0A V <sub>DS</sub> =-15V V <sub>GS</sub> =-10V
Gate-Source Charge	Q <sub>gs</sub>	-	2	-		
Gate-Drain ("Miller") Change	Q <sub>gd</sub>	-	3.8	-		
Turn-on Delay Time <sup>2</sup>	T <sub>d(on)</sub>	-	8.3	-	ns	V <sub>DS</sub> =-15V V <sub>GS</sub> =-10V R <sub>G</sub> =3Ω R <sub>L</sub> =3Ω
Rise Time	T <sub>r</sub>	-	5	-		
Turn-off Delay Time	T <sub>d(off)</sub>	-	29	-		
Fall Time	T <sub>f</sub>	-	14	-		
Input Capacitance	C <sub>iss</sub>	-	700	840	pF	V <sub>GS</sub> =0V V <sub>DS</sub> =-15V f=1.0MHz
Output Capacitance	C <sub>oss</sub>	-	120	-		
Reverse Transfer Capacitance	C <sub>rss</sub>	-	75	-		
Gate Resistance	R <sub>g</sub>	-	10	-	Ω	f=1.0MHz

**Source-Drain Diode**

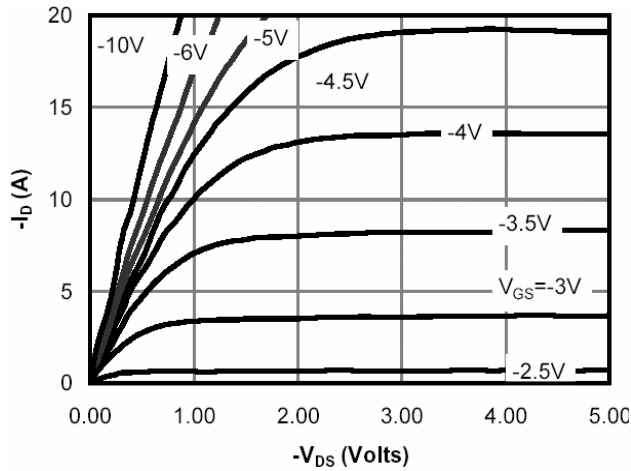
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Forward On Voltage <sup>2</sup>	V <sub>SD</sub>	-	-	-1.0	V	I <sub>S</sub> =-1.0A, V <sub>GS</sub> =0V
Reverse Recovery Time <sup>2</sup>	T <sub>rr</sub>	-	23.5	-	ns	I <sub>S</sub> =-5.0A, V <sub>GS</sub> =0V di/dt=100A/μs
Reverse Recovery Charge	Q <sub>rr</sub>	-	13.4	-	nC	

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

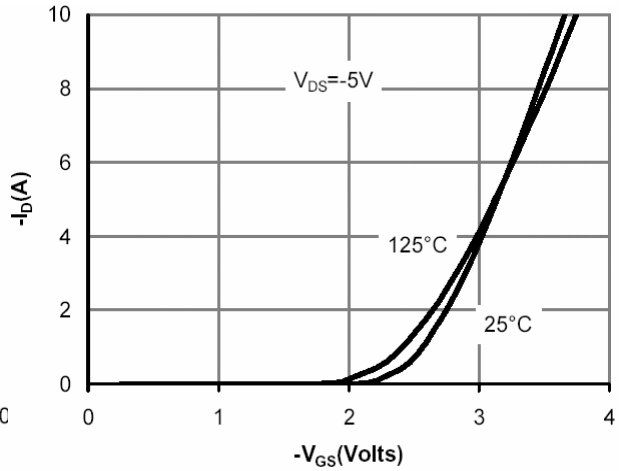
2. Pulse width ≤ 300us, duty cycle ≤ 2%.

3. Surface mounted on 1 in<sup>2</sup> copper pad of FR4 board; 156°C/W when mounted on Min. copper pad.

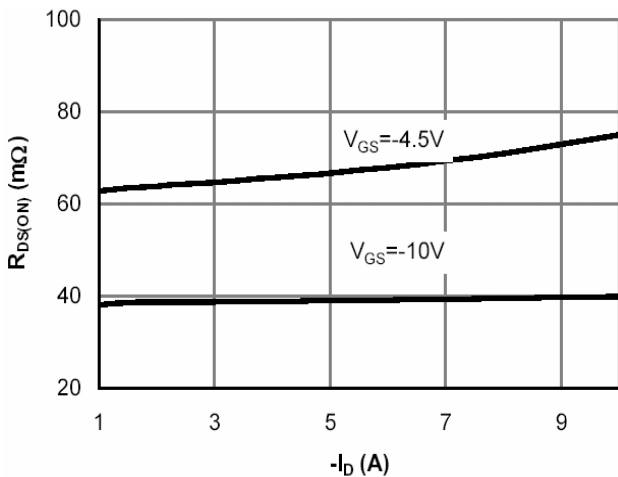
**Characteristics Curve**



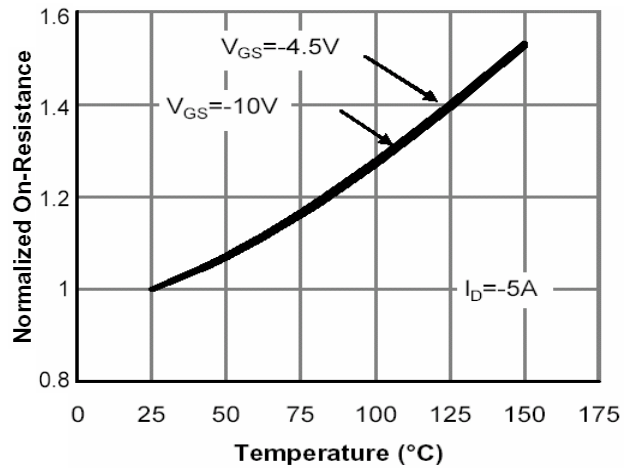
**Fig 1. Typical Output Characteristics**



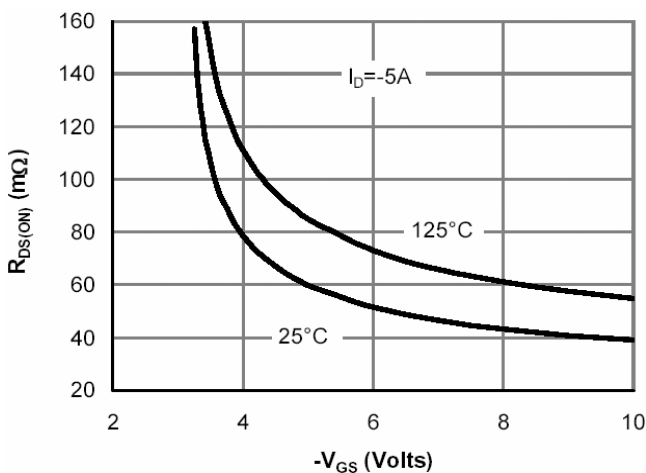
**Fig 2. Transfer Characteristics**



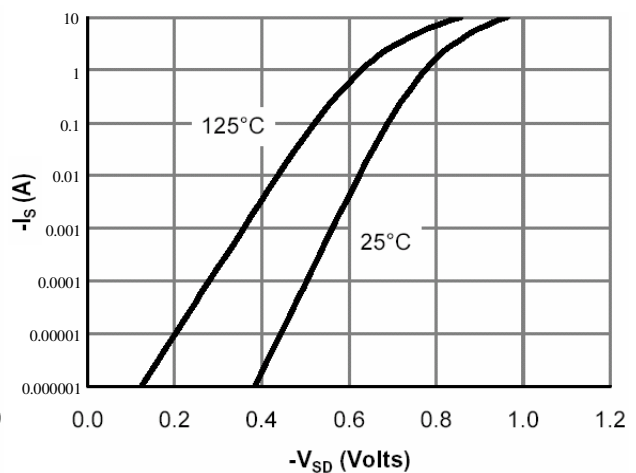
**Fig 3. On-Resistance v.s. Drain Current and Gate Voltage**



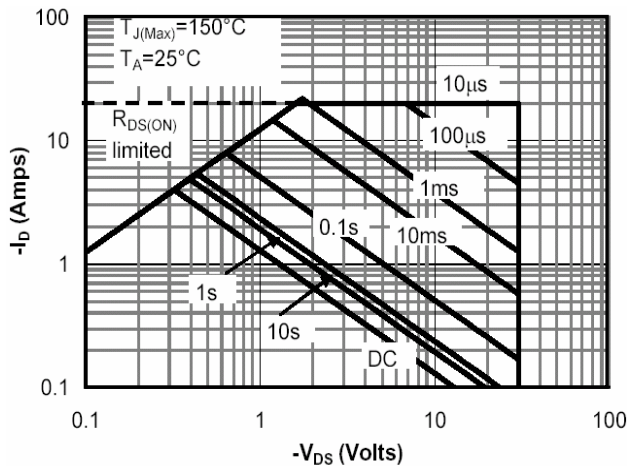
**Fig 4. On-Resistance v.s. Junction Temperature**



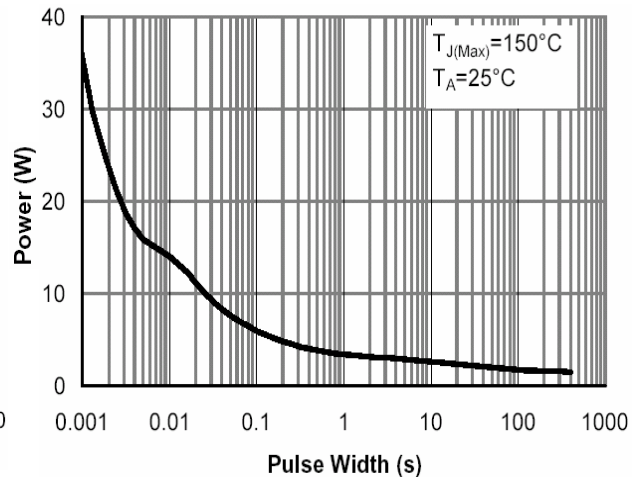
**Fig 5. On-Resistance v.s. Gate-Source Voltage**



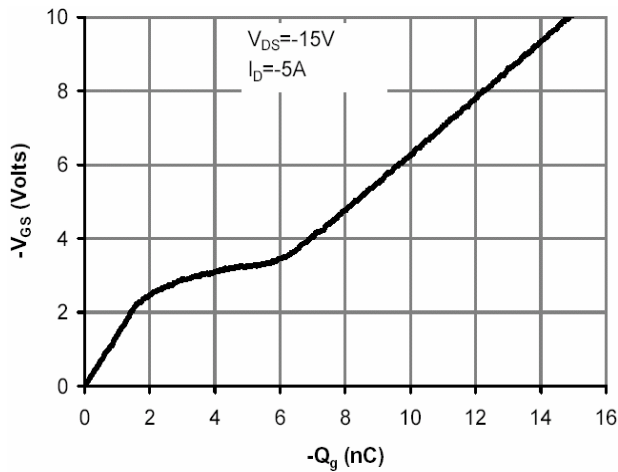
**Fig 6. Body Diode Characteristics**



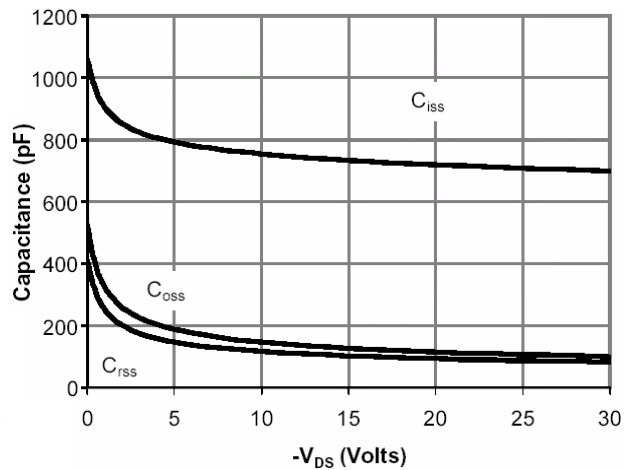
**Fig 7. Maximum Safe Operating Area**



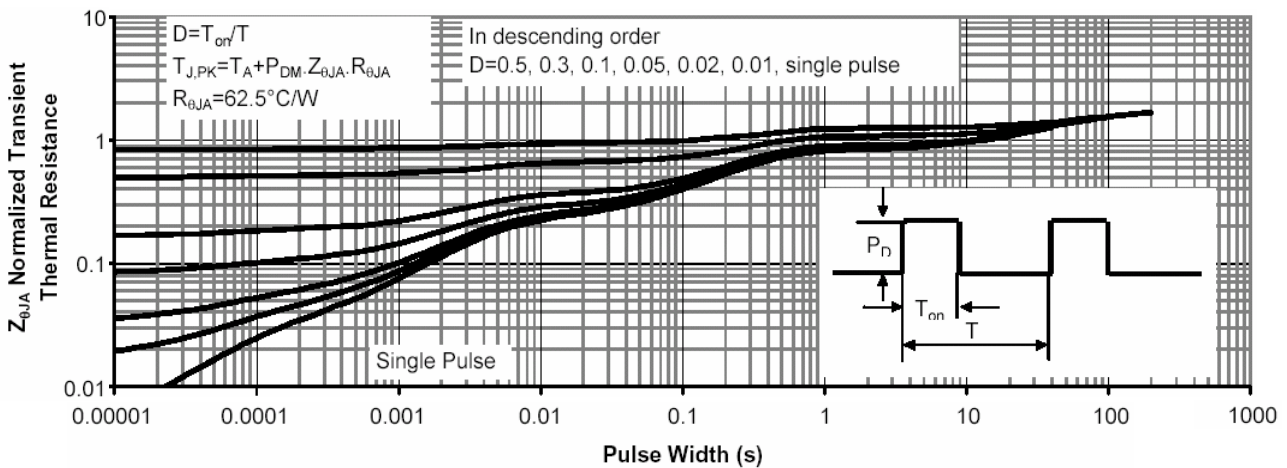
**Fig 8. Single Pulse Power Rating Junction-to-Ambient**



**Fig 9. Gate Charge Characteristics**



**Fig 10. Typical Capacitance Characteristics**



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

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