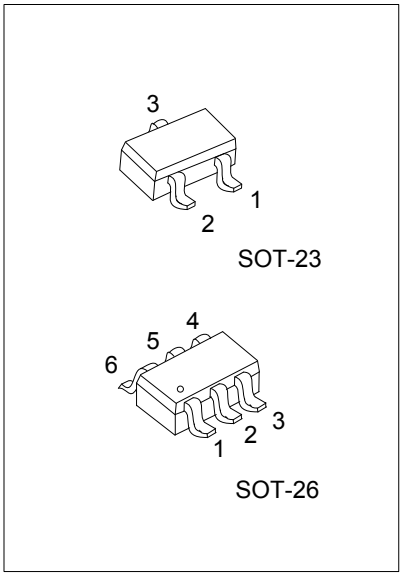
UT6402

Power MOSFET

N-CHANNEL ENHANCEMENT MODE

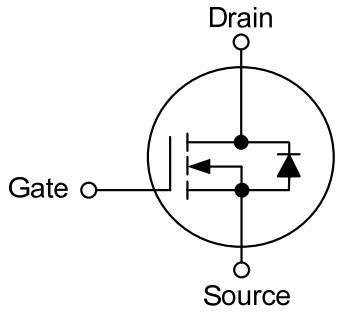


■ DESCRIPTION

The **UT6402** is N-Channel enhancement mode Power MOSFET, designed with high density cell, with fast switching speed, low on-resistance, excellent thermal and electrical capabilities, operation with low gate voltages.

This device is suitable for use as a load switch or in PWM applications.

■ SYMBOL



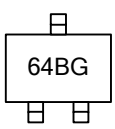
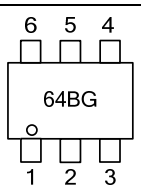
■ ORDERING INFORMATION

Ordering Number	Package	Pin Assignment						Packing
		1	2	3	4	5	6	
UT6402G-AE3-R	SOT-23	S	G	D	-	-	-	Tape Reel
UT6402G-AG6-R	SOT-26	D	D	G	S	D	D	Tape Reel

Note: Pin Assignment: S: Source G: Gate D: Drain

UT6402G-AE3-R (1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel (2) AE3: SOT-23, AG6: SOT-26 (3) G: Halogen Free and Lead Free

■ MARKING

SOT-23	SOT-26
	

■ ABSOLUTE MAXIMUM RATINGS (T_A = 25°C, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V_{DSS}	30	V
Gate-Source Voltage	V_{GSS}	±20	V
Continuous Drain Current (Note 3)	I_D	6.9	A
Pulsed Drain Current (Note 2)	I_{DM}	20	A
Power Dissipation	P_D	2	W
Junction Temperature	T_J	+150	°C
Strong Temperature	T_{STG}	-55 ~ +150	°C

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ THERMAL DATA

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Junction to Ambient (Note 3)	θ_{JA}		74	110	°C/W

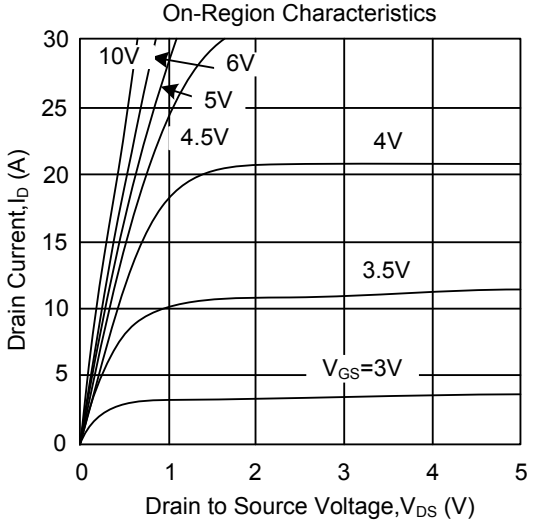
■ ELECTRICAL CHARACTERISTICS (T_J =25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} =0 V, I_D =250μA	30			V
Drain-Source Leakage Current	I_{DSS}	V_{DS} =30V, V_{GS} =0 V			1	μA
Gate-Source Leakage Current	I_{GSS}	V_{DS} =0 V, V_{GS} = ±20V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS} =V_{GS}, I_D =250 μA	1	1.9	3	V
On State Drain Current	$I_{D(ON)}$	V_{DS} =5V, V_{GS} =4.5V	20			A
Static Drain-Source On-Resistance (Note 2)	$R_{DS(ON)}$	V_{GS} =10V, I_D =6.9A		22.5	28	mΩ
		V_{GS} =4.5V, I_D =5.0A		34.5	42	mΩ
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{ISS}	V_{DS} =15 V, V_{GS} =0V, f=1MHz		680	820	pF
Output Capacitance	C_{OSS}			102		
Reverse Transfer Capacitance	C_{RSS}			77	108	
SWITCHING CHARACTERISTICS						
Turn-ON Delay Time (Note 2)	$t_{D(ON)}$	V_{GS}=10V, V_{DS}=15V, R_L=2.2Ω, R_G =3Ω		4.6		ns
Turn-ON Rise Time	t_R			4.1		
Turn-OFF Delay Time	$t_{D(OFF)}$			20.6		
Turn-OFF Fall-Time	t_F			5.2		
Total Gate Charge (Note 2)	Q_G	V_{DS} =15V, V_{GS} =10V, I_D =6.9A	11.5	13.88	16.7	nC
Gate Source Charge	Q_{GS}			1.82		
Gate Drain Charge	Q_{GD}			3.2		
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage	V_{SD}	I_S=1A		0.76	1	V
Maximum Body-Diode Continuous Current	I_S				3	A
Reverse Recovery Time	t_{RR}	I_F=6.9 A, dI/dt=100A/μs		16.5	20	ns
Reverse Recovery Charge	Q_{RR}	I_F=6.9 A, dI/dt=100A/μs		7.8		nC

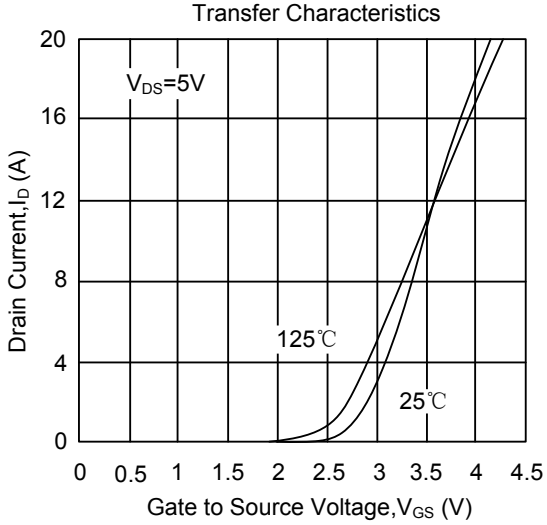
Notes: 1. Pulse width limited by $T_{J(MAX)}$
2. Pulse width ≤300us, duty cycle ≤0.5%.
3. Surface mounted on 1 in^2 copper pad of FR4 board.

■ TYPICAL CHARACTERISTICS

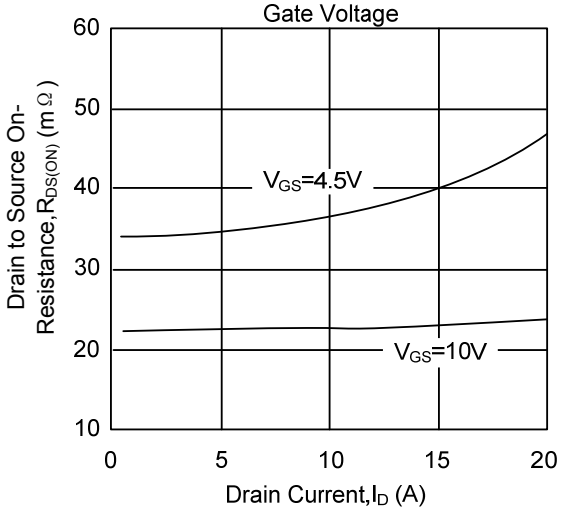
On-Region Characteristics



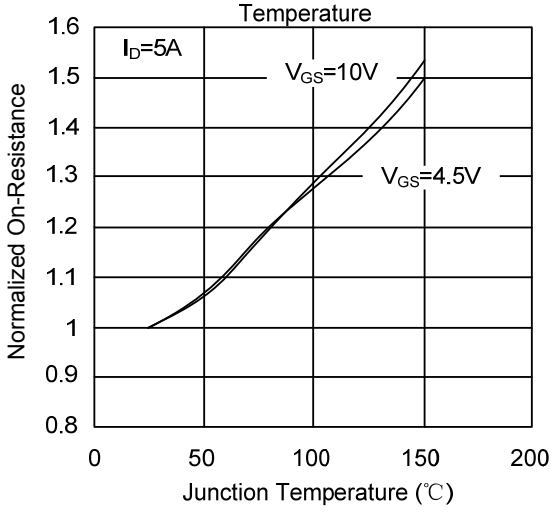
Transfer Characteristics



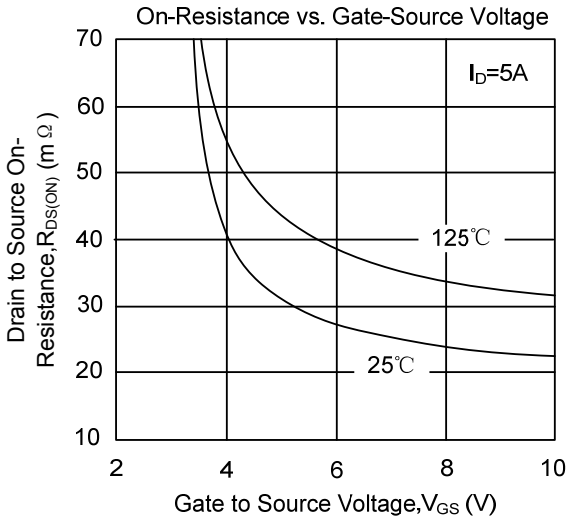
On-Resistance vs. Drain Current and Gate Voltage



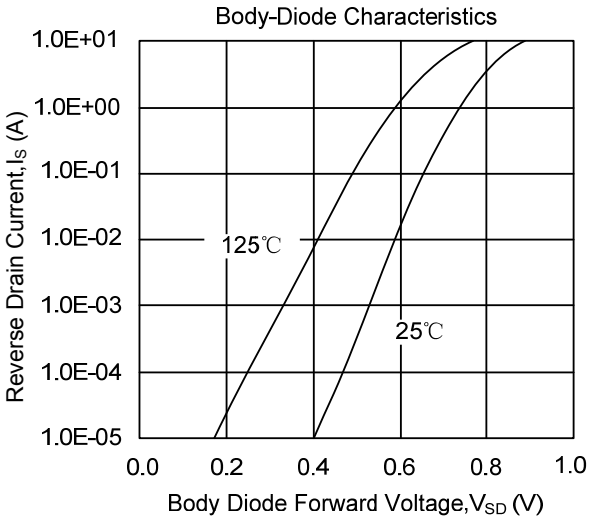
On-Resistance vs. Junction Temperature



On-Resistance vs. Gate-Source Voltage

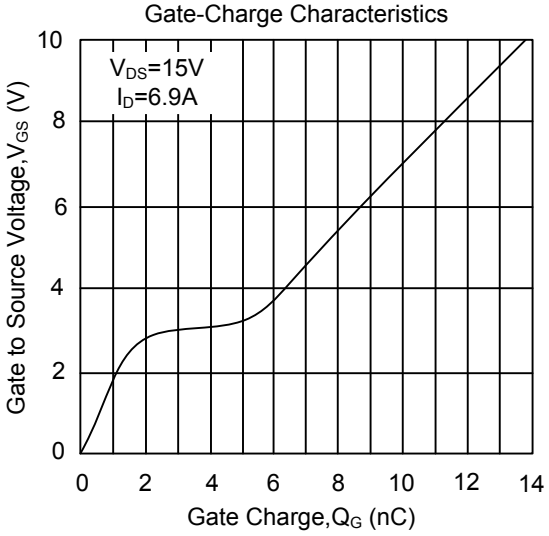


Body-Diode Characteristics

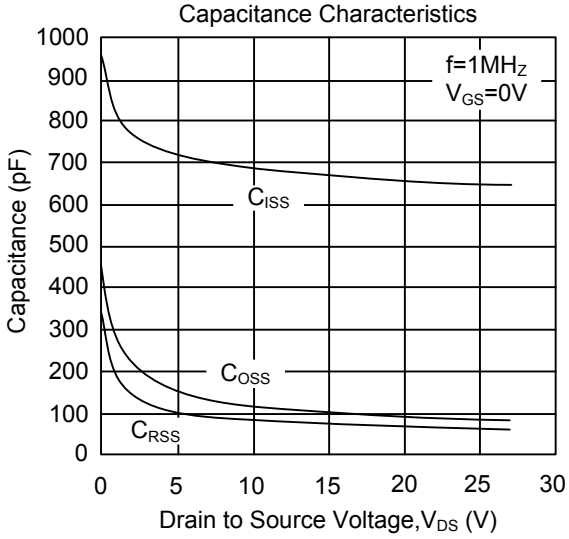


■ TYPICAL CHARACTERISTICS(Cont.)

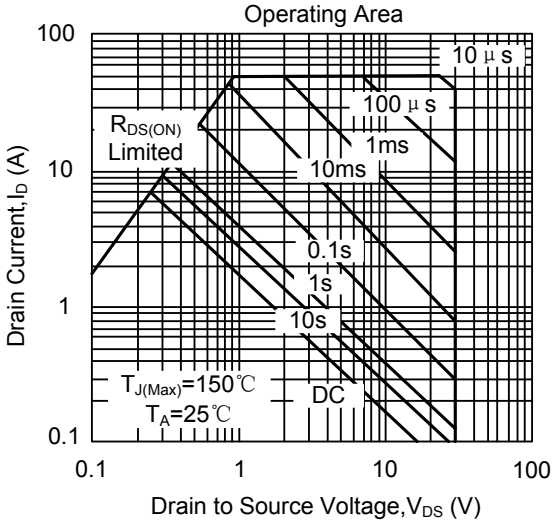
Gate-Charge Characteristics



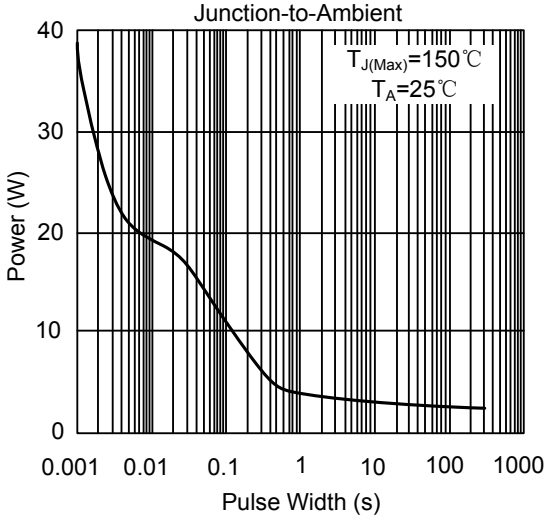
Capacitance Characteristics



Maximum Forward Biased Safe Operating Area



Single Pulse Power Rating Junction-to-Ambient



Normalized Maximum Transient Thermal Impedance