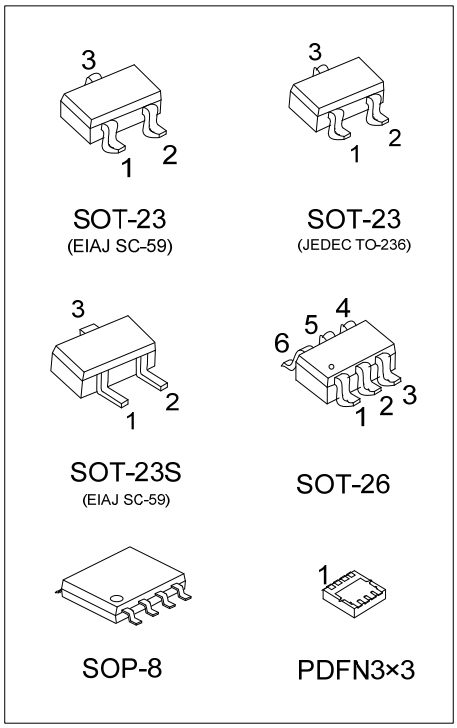
UT3404

Power MOSFET

N-CHANNEL ENHANCEMENT MODE MOSFET

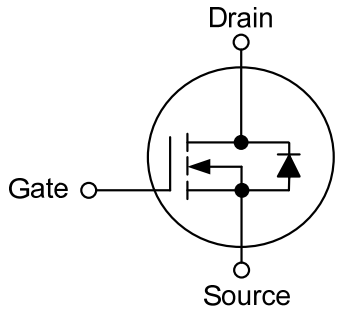


■ DESCRIPTION

The **UT3404** is N-Channel enhancement mode power MOSFET, designed with high density cell, with fast switching speed, low on-resistance, excellent thermal and electrical capabilities and operation with low gate voltages.

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

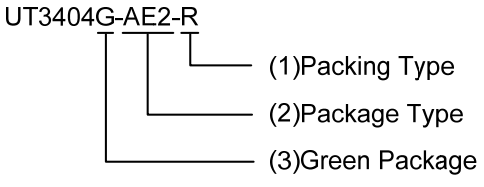
■ SYMBOL



■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT3404L-AE2-R	UT3404G-AE2-R	SOT-23-3	G	S	D	-	-	-	-	-	Tape Reel
UT3404L-AE3-R	UT3404G-AE3-R	SOT-23	G	S	D	-	-	-	-	-	Tape Reel
UT3404L-AE3S-R	UT3404G-AE3S-R	SOT-23S	G	S	D	-	-	-	-	-	Tape Reel
UT3404L-AG6-R	UT3404G-AG6-R	SOT-26	D	D	G	S	D	D	-	-	Tape Reel
UT3404L-S08-R	UT3404G-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel
UT3404L-P3030-R	UT3404G-P3030-R	PDFN3×3	S	S	S	G	D	D	D	D	Tape Reel

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

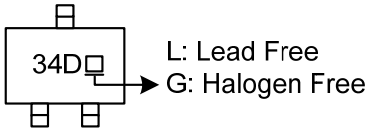
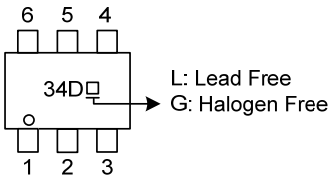
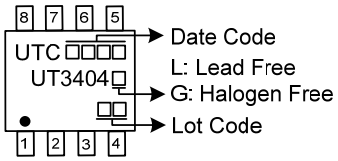
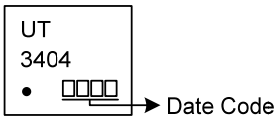


(1) R: Tape Reel

(2) AE2: SOT-23-3, AE3: SOT-23, AE3S: SOT-23S
AG6: SOT-26, S08: SOP-8, P3030: PDFN3×3

(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING

SOT-23-3 / SOT-23 / SOT-23S	SOT-26
	
SOP-8	**PDFN3×3**
	

■ ABSOLUTE MAXIMUM RATINGS (T_C=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	5.8	A
Pulsed Drain Current (Note 2)		I_{DM}	20	A
Power Dissipation	SOT-23-3/SOT-23 SOT-23S	P_D	1.4	W
	SOT-26		1.5	W
	SOP-8		1.8	W
	PDFN3×3		15	W
Junction Temperature		T_J	+150	°C
Strong Temperature		T_{STG}	-55 ~ +150	°C

Notes: 1. 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.
2. Repetitive Rating: Pulse width limited by maximum junction temperature.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOT-23-3/SOT-23 SOT-23S	θ_{JA}	90	°C/W
	SOT-26		83	°C/W
	SOP-8		70	°C/W
	PDFN3×3		75	°C/W
Junction to Case	PDFN3×3	θ_{JC}	8.33	°C/W

Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

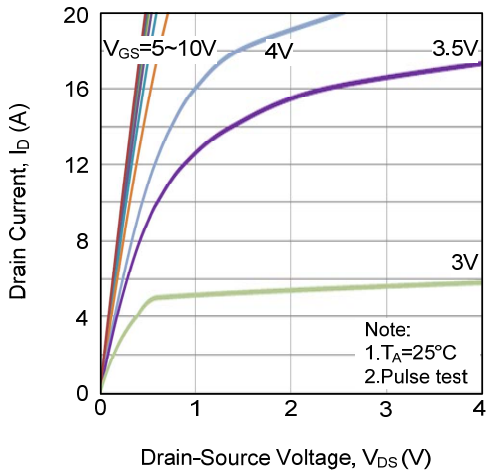
■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	30			V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=30V, V_{GS}=0V			1	μA
Gate-Source Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250μA	1.0		3.0	V
Static Drain-Source On-Resistance (Note 2)	$R_{DS(ON)}$	V_{GS}=10V, I_D=5.8A			28	mΩ
		V_{GS}=4.5V, I_D=5.0A			48	mΩ
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{ISS}	V_{DS}=15V, V_{GS}=0V, f=1MHz		285		pF
Output Capacitance	C_{OSS}			85		pF
Reverse Transfer Capacitance	C_{RSS}			70		pF
SWITCHING CHARACTERISTICS						
Total Gate Charge (Note 2)	Q_G	V_{DS}=24V, V_{GS}=10V, I_D=5.8A (Note1,2)		17		nC
Gate Source Charge	Q_{GS}			2.2		nC
Gate Drain Charge	Q_{GD}			4.6		nC
Turn-ON Delay Time (Note 2)	$t_{D(ON)}$	V_{DD}=15V, V_{GS}=10V, I_D=5.8A, R_G=3Ω (Note1,2)		5		ns
Turn-ON Rise Time	t_R			16		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			14		ns
Turn-OFF Fall-Time	t_F			24		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I_S				5.8	A
Drain-Source Diode Forward Voltage	V_{SD}	I_S=1.0A		0.76	1	V

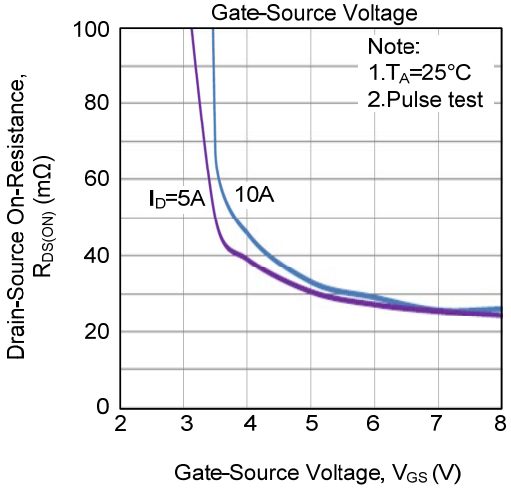
Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.
2. Essentially independent of operating temperature

■ TYPICAL CHARACTERISTICS

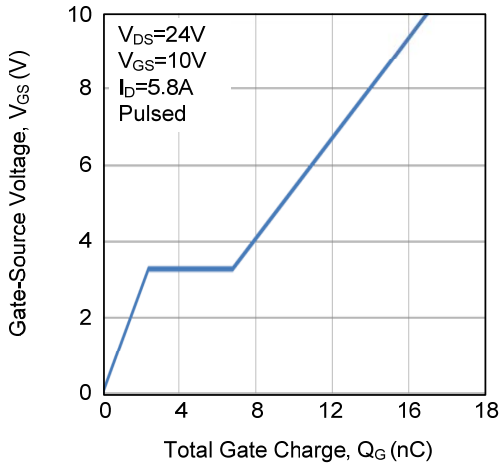
Drain Current vs. Drain-Source Voltage



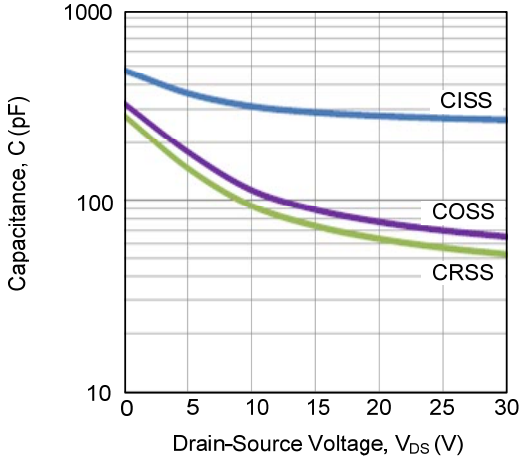
Drain-Source On-Resistance vs. Gate-Source Voltage



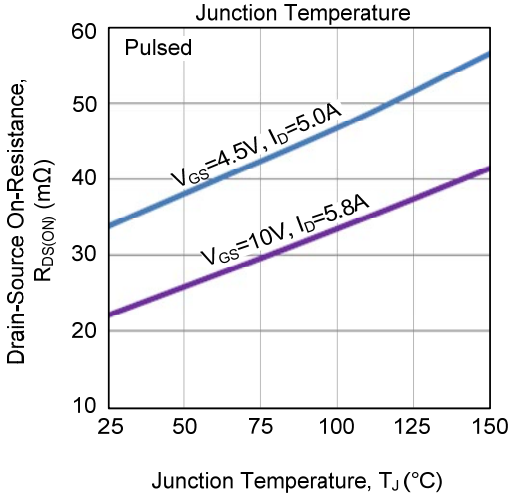
Gate Charge Characteristics



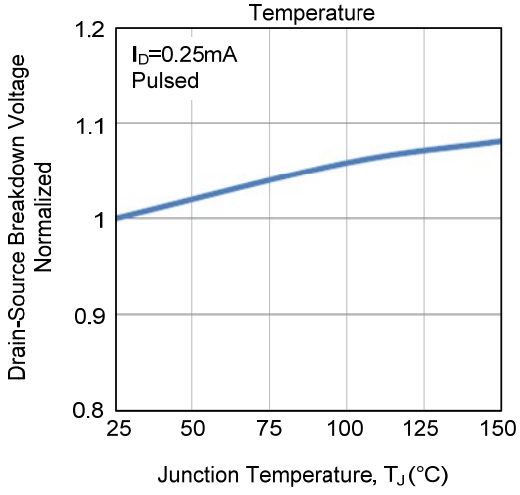
Capacitance Characteristics



Drain-Source On-Resistance vs. Junction Temperature

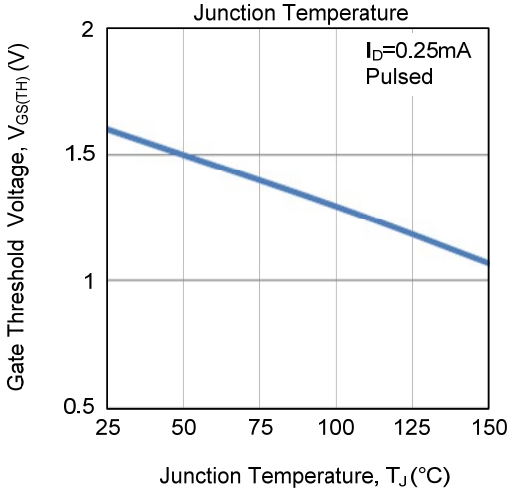


Breakdown Voltage vs. Junction Temperature

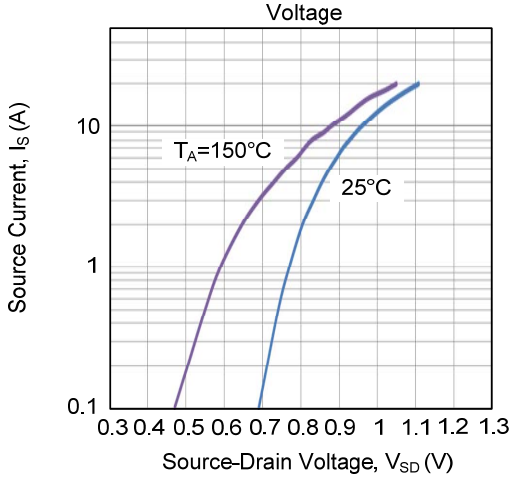


■ TYPICAL CHARACTERISTICS (Cont.)

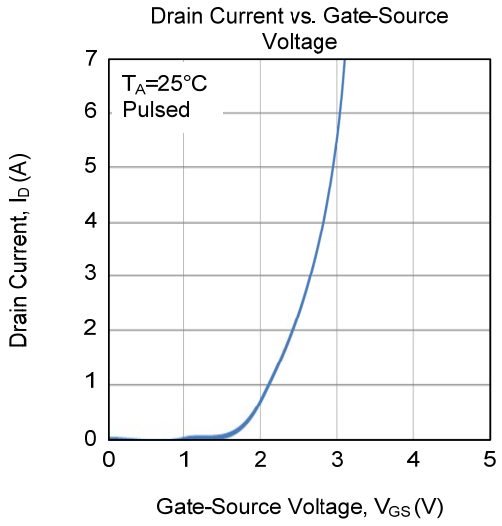
Gate Threshold Voltage vs. Junction Temperature



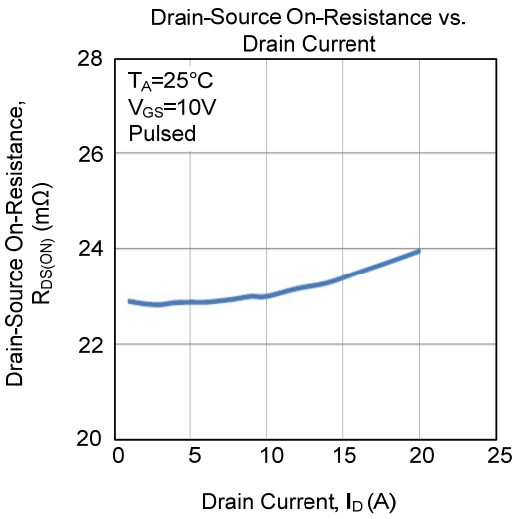
Source Current vs. Source-Drain Voltage



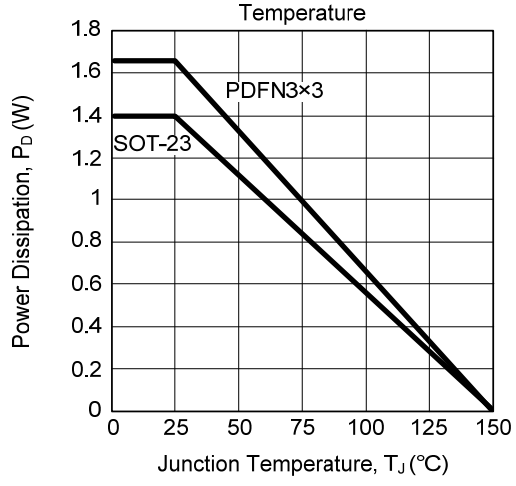
Drain Current vs. Gate-Source Voltage



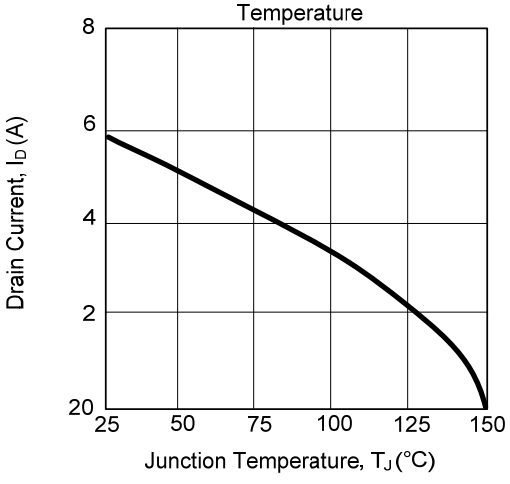
Drain-Source On-Resistance vs. Drain Current



Power Dissipation vs. Junction Temperature

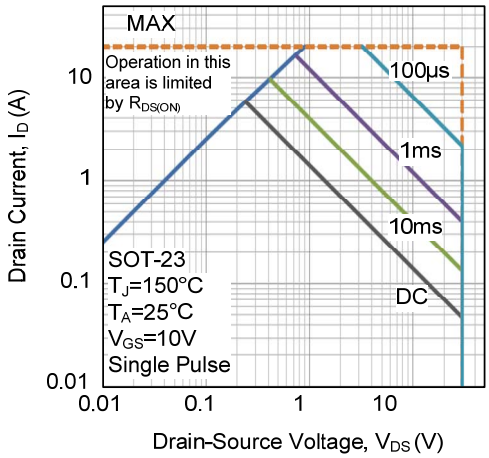


Drain Current vs. Junction Temperature

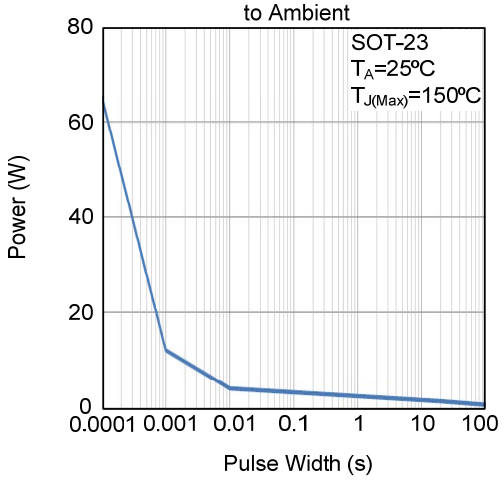


■ TYPICAL CHARACTERISTICS (Cont.)

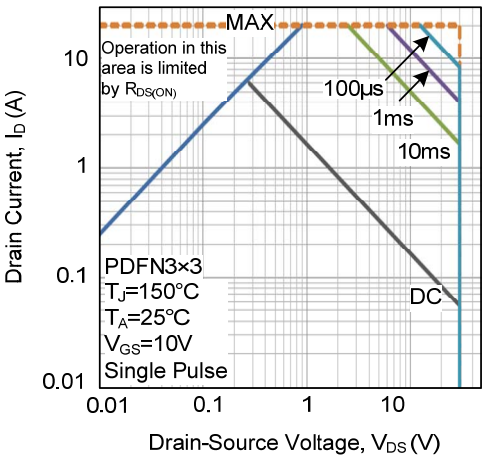
Safe Operating Area (Note)



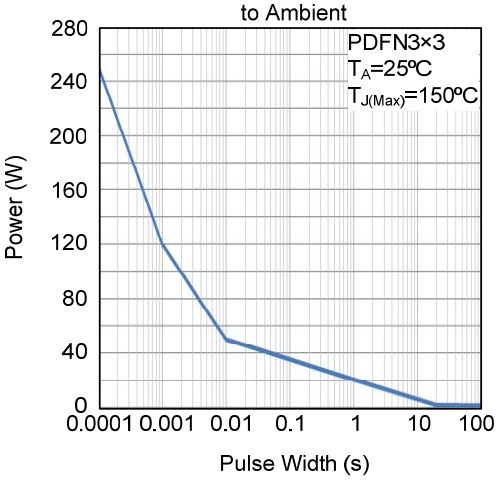
Single Pulse Power Rating Junction to Ambient



Safe Operating Area (Note)



Single Pulse Power Rating Junction to Ambient



Note: These tests are performed with the device
Mounted on 1 in 2 FR-4 board with 2oz.
Copper, in a still air environment with T_A=25°C.
The SOA curve provides a single pulse rating.