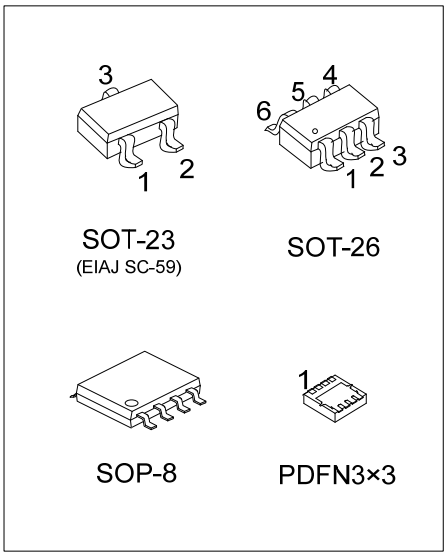
UT3404

Power MOSFET

N-CHANNEL ENHANCEMENT MODE MOSFET

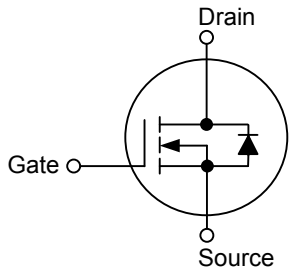


■ DESCRIPTION

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.

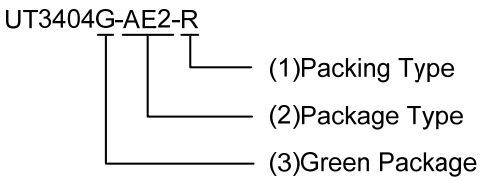
■ SYMBOL



■ ORDERING INFORMATION

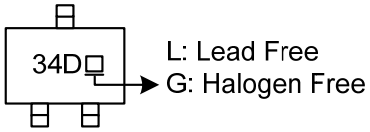
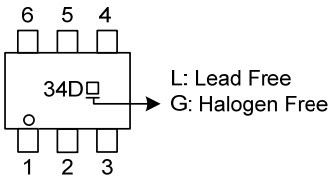
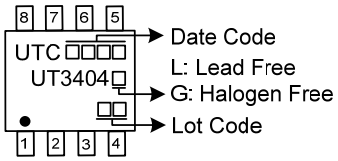
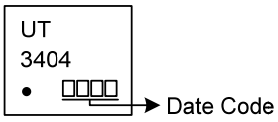
Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT3404L-AE2-R	UT3404G-AE2-R	SOT-23-3	G	S	D	-	-	-	-	-	Tape Reel
UT3404L-AE3-R	UT3404G-AE3-R	SOT-23	G	S	D	-	-	-	-	-	Tape Reel
UT3404L-AG6-R	UT3404G-AG6-R	SOT-26	D	D	G	S	D	D	-	-	Tape Reel
UT3404L-S08-R	UT3404G-S08-R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

■ 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		I_D	5.8	A
Pulsed Drain Current		I_{DM}	20	A
Power Dissipation	SOT-23-3/SOT-23	P_D	1.4	W
	SOT-26		1.6	W
	SOP-8		2	W
	PDFN3×3		18	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	RATINGS	UNIT
Junction to Ambient	SOT-23-3/SOT-23	θ_{JA}	85	°C/W
	SOT-26		115	°C/W
	SOP-8		62.5	°C/W
	PDFN3×3		75	°C/W
Junction to Case	PDFN3×3	θ_{JC}	6.9	°C/W

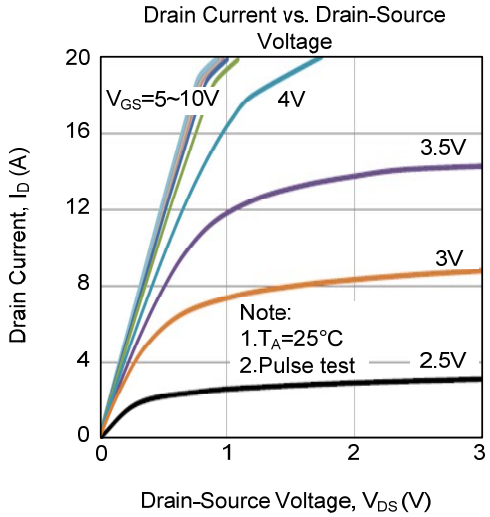
Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

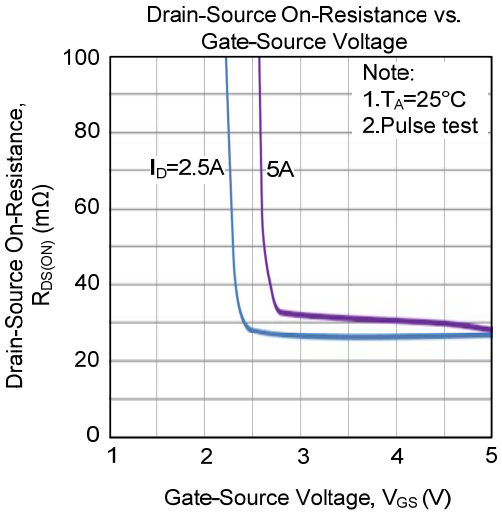
■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified)

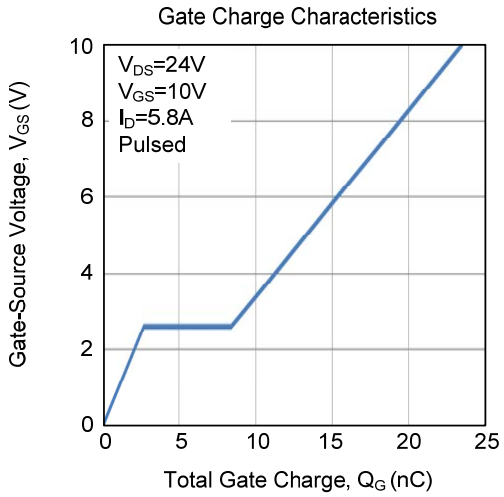
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250uA	30			V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=24V, V_{GS}=0V			1	uA
Gate-Source Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250uA	1.0		3.0	V
Drain-Source On-State 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_{GS}=0V,V_{DS}=15V, f=1.0MHz		590		pF
Output Capacitance	C_{OSS}			270		pF
Reverse Transfer Capacitance	C_{RSS}			120		pF
SWITCHING CHARACTERISTICS						
Total Gate Charge (Note 2)	Q_G	V_{DS}=24V, V_{GS}=10V, I_D=5.8A		23.5		nC
Gate-Source Charge	Q_{GS}			2.7		nC
Gate-Drain Charge	Q_{GD}			5.7		nC
Turn-ON Delay Time (Note 2)	$t_{D(ON)}$	V_{DS}=15V, V_{GS}=10V, I_D=5.8A, R_G=3Ω		5		ns
Turn-ON Rise Time	t_R			16		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			28		ns
Turn-OFF Fall Time	t_F			21		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Continuous Drain-Source Diode Forward Current	I_S				5.8	A
Drain-Source Diode Forward Voltage(Note2)	V_{SD}	I_S=1.0A			1.0	V
Reverse Recovery Time	t_{rr}	I_F=5.8A, dI/dt=100A/μs		200		ns
Reverse Recovery Charge	Q_{rr}			440		nC

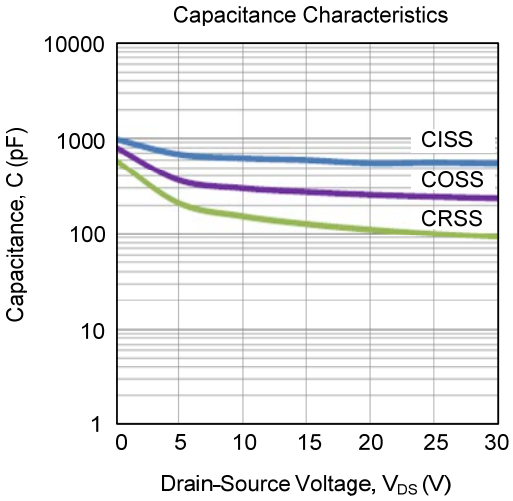
Notes: 1. Repetitive Rating : Pulse width limited by maximum junction temperature.
2. Pulse width ≤ 300μs, duty cycle ≤ 2%.

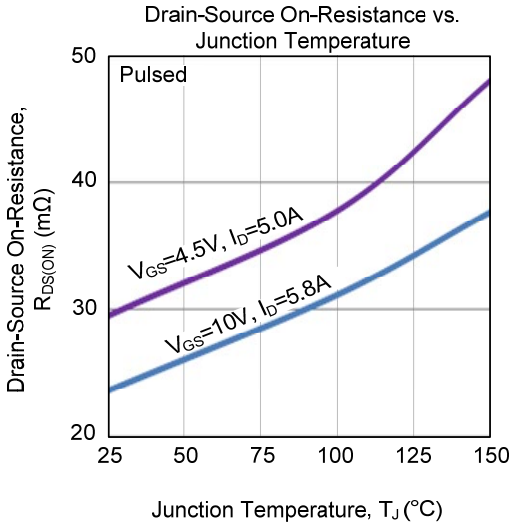
■ TYPICAL CHARACTERISTICS

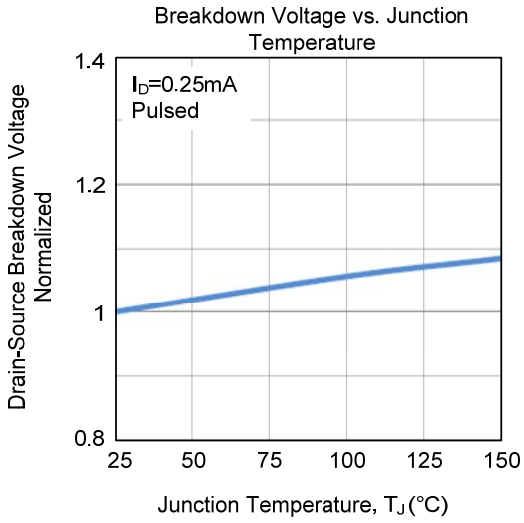






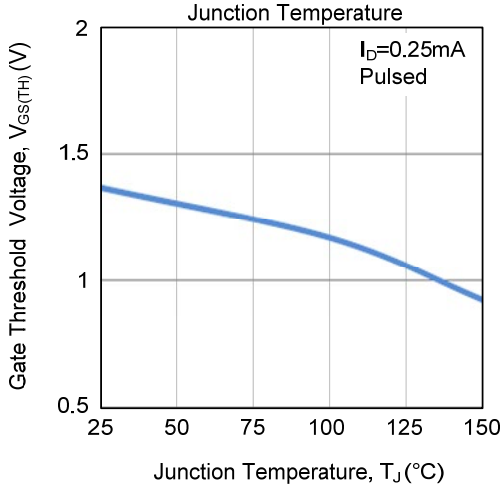




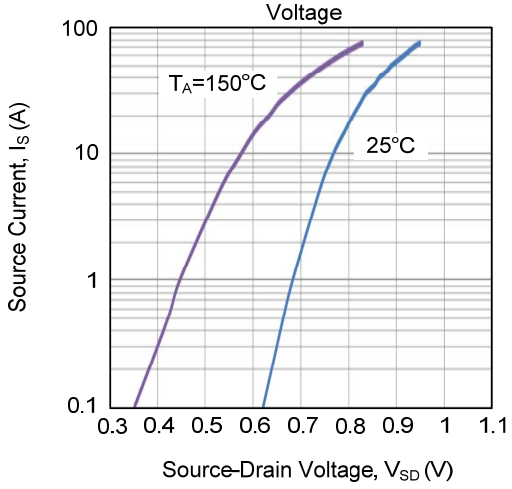


■ TYPICAL CHARACTERISTICS (Cont.)

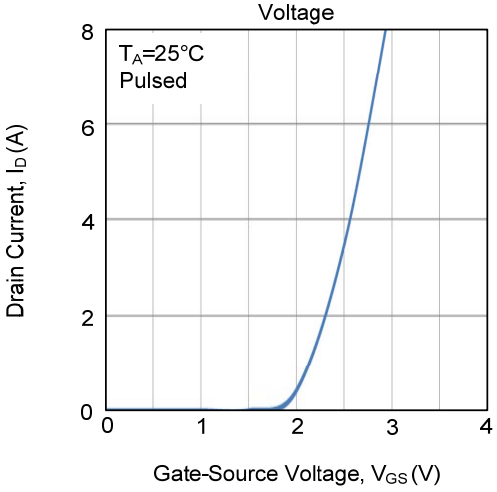
Gate Threshold Voltage vs. Junction Temperature



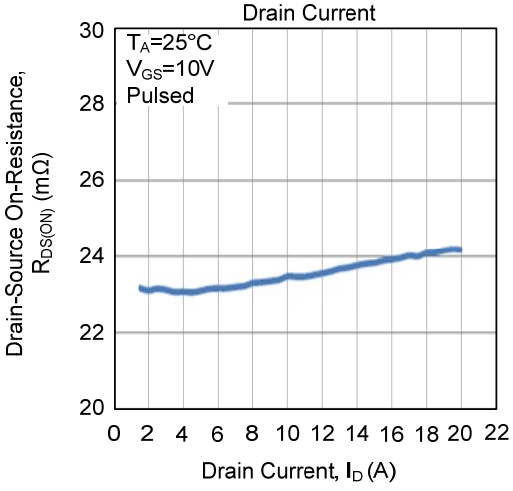
Source Current vs. Source-Drain Voltage



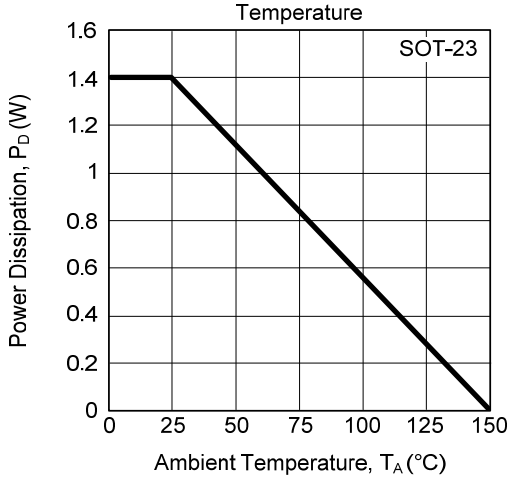
Drain Current vs. Gate-Source Voltage



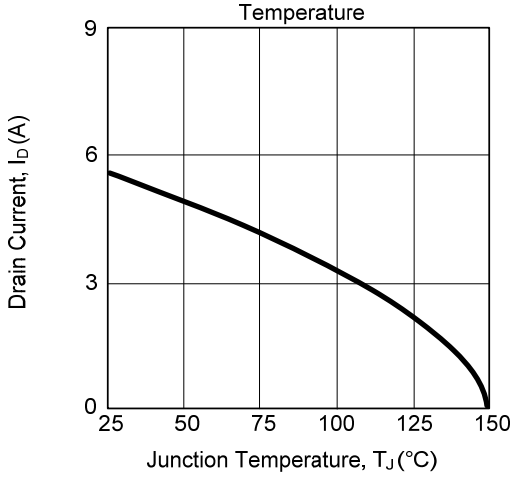
Drain-Source On-Resistance vs. Drain Current



Power Dissipation vs. Ambient Temperature

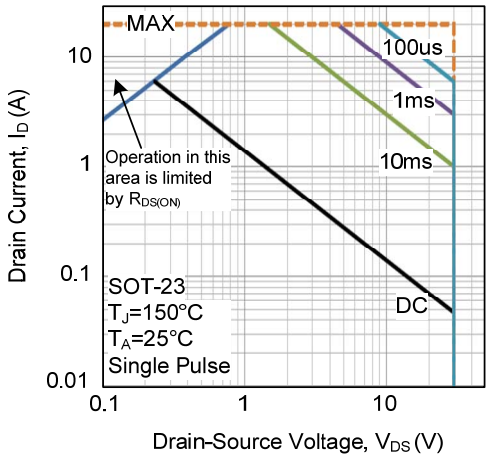


Drain Current vs. Junction Temperature

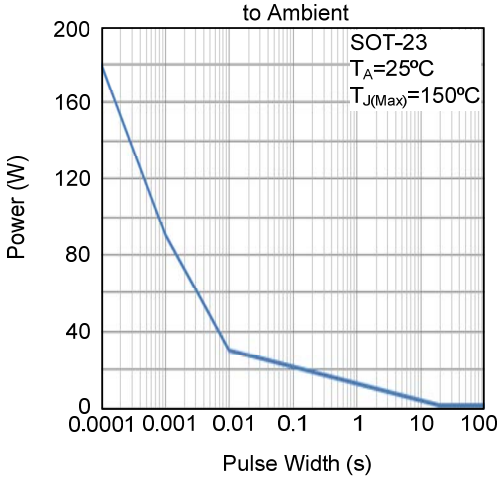


■ TYPICAL CHARACTERISTICS (Cont.)

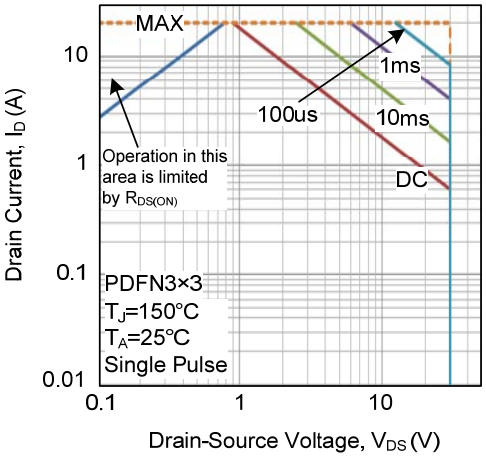
Safe Operating Area (Note)



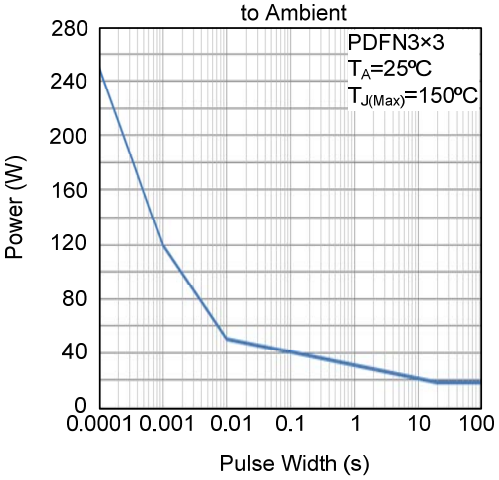
Single Pulse Power Rating Junction to Ambient



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.