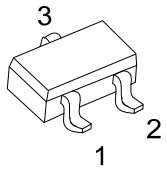
UDN302

Power MOSFET

P-CHANNEL 2.5V SPECIFIED POWERTRENCH MOSFET



SOT-23
(EIAJ SC-59)

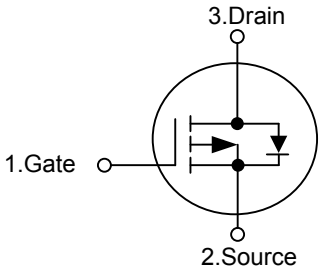
■ DESCRIPTION

The **UDN302** uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with low gate voltages. This device is suitable for use as a load switch or in PWM applications.

■ FEATURES

* $R_{DS(ON)} \leq 55m\Omega$ @ V_{GS}=-4.5V, I_D=-2.4A
* $R_{DS(ON)} \leq 80m\Omega$ @ V_{GS}=-2.5V, I_D=-2A
* Low capacitance
* Low gate charge
* Fast switching capability
* Avalanche energy specified

■ SYMBOL



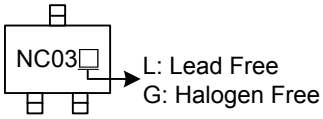
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UDN302L-AE3-R	UDN302G-AE3-R	SOT-23	G	S	D	Tape Reel

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

UDN302G-AE3-R (1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel (2) AE3: SOT-23 (3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



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

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V_{DSS}	-20	V
Gate-Source Voltage	V_{GSS}	±12	V
Continuous Drain Current	I_D	-2.4	A
Pulsed Drain Current	I_{DM}	-10	A
Maximum Power Dissipation	P_D	0.5	W
Junction Temperature	T_J	+150	°C
Storage 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 CHARACTERISTICS

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Junction-to-Ambient	θ_{JA}			250	°C/W
Junction-to-Case	θ_{JC}			75	°C/W

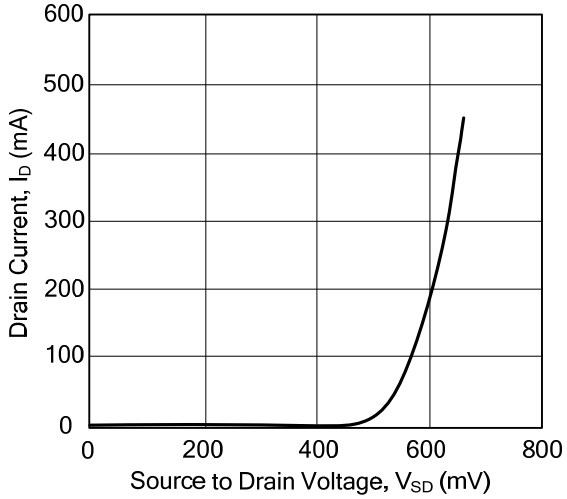
■ ELECTRICAL CHARACTERISTICS (T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=-250μA	-20			V
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	I_D=-250μA, Referenced to 25°C		-12		mV/°C
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-16V, V_{GS}=0V			-1	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±12V, V_{DS}=0V			±100	nA
ON CHARACTERISTICS(Note)						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS} =V_{GS}, I_D =-250μA	-0.6	-1.0	-1.5	V
Gate Threshold Voltage Temperature Coefficient	$\Delta V_{GS(TH)}/\Delta T_J$	I_D=-250 μA, Referenced to 25°C		3		mV/°C
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-4.5V, I_D=-2.4A		44	55	mΩ
		V_{GS}=-2.5V, I_D=-2A		64	80	
On-State Drain Current	$I_{D(ON)}$	V_{GS}=-4.5V, V_{DS}=-5V	-10			A
Forward Transconductance	g_{FS}	V_{DS}=-5V, I_D=-2.4A		10		S
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	V_{DS}=-10V, V_{GS}=0V, f=1.0MHz		882		pF
Output Capacitance	C_{OSS}			211		pF
Reverse Transfer Capacitance	C_{RSS}			112		pF
SWITCHING PARAMETERS (Note)						
Total Gate Charge	Q_G	V_{DS}=-10V, I_D=-2.4A, V_{GS}=-4.5V		9	14	nC
Gate Source Charge	Q_{GS}			2		nC
Gate Drain Charge	Q_{GD}			3		nC
Turn-ON Delay Time	$t_{D(ON)}$	V_{DD}=-10V, I_D=-1A, V_{GS}=-4.5V R_G=6Ω		13	23	ns
Turn-ON Rise Time	t_R			11	20	ns
Turn-OFF Delay Time	$t_{D(OFF)}$			25	40	ns
Turn-OFF Fall-Time	t_F			15	27	ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=-0.42A (Note)		-0.7	-1.2	V
Maximum Body-Diode Continuous Current	I_S				-0.42	A

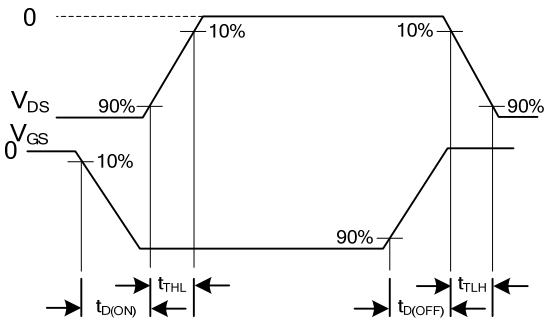
Note: Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%

■ TYPICAL CHARACTERISTICS

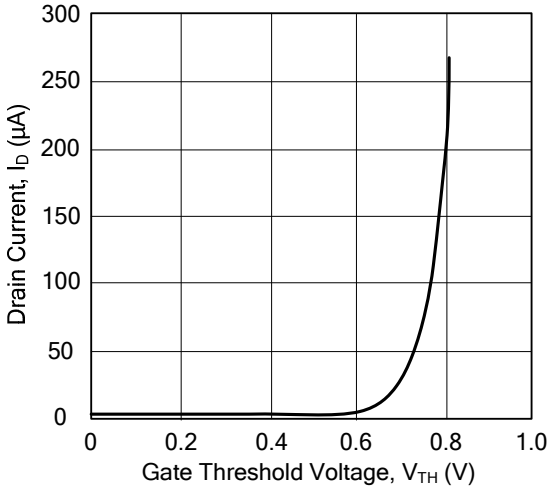
Drain Current vs. Source to Drain Voltage



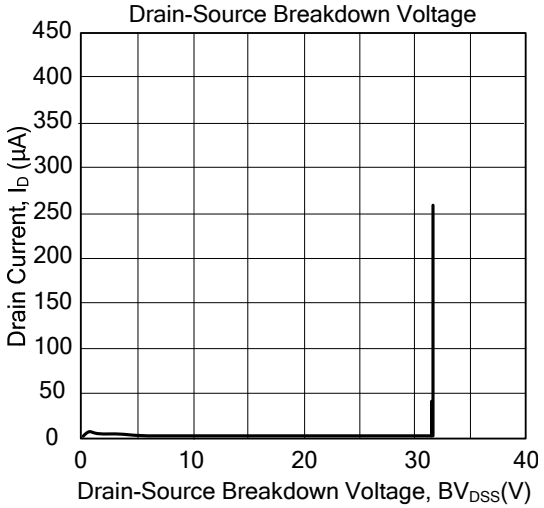
Switching Time Waveforms



Drain Current vs. Gate Threshold Voltage



Drain Current vs.
Drain-Source Breakdown Voltage



Drain-Source On-State
Resistance Characteristics