



UT1NN02

Power MOSFET

750mA, 20V N-CHANNEL POWER MOSFET

DESCRIPTION

The UTC **UT1NN02** is N-channel enhancement mode power MOSFET using UTC's advanced technology to provide the customers with perfect $R_{DS(ON)}$ and low gate charge. This device can be operated with 4.5V low gate voltage.

FEATURES

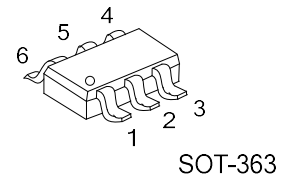
* $R_{DS(ON)} \leq 300 \text{ m}\Omega$ @ $V_{GS} = 4.5\text{V}$, $I_D = 600\text{mA}$

$R_{DS(ON)} \leq 450 \text{ m}\Omega$ @ $V_{GS} = 2.5\text{V}$, $I_D = 200\text{mA}$

$R_{DS(ON)} \leq 600 \text{ m}\Omega$ @ $V_{GS} = 1.8\text{V}$, $I_D = 100\text{mA}$

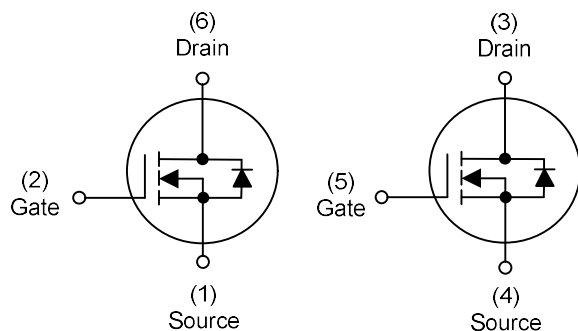
$R_{DS(ON)} \leq 850 \text{ m}\Omega$ @ $V_{GS} = 1.5\text{V}$, $I_D = 50\text{mA}$

* Green & Pb Free



SOT-363

SYMBOL



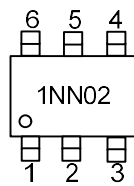
ORDERING INFORMATION

Ordering Number	Package	Pin Assignment						Packing
		1	2	3	4	5	6	
UT1NN02G-AL6-R	SOT-363	S1	G1	D2	S2	G2	D1	Tape Reel

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

UT1NN02G-AL6-R	(1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel (2) AL6: SOT-363 (3) G: Halogen Free and Lead Free
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■ MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V _{DSS}	20	V
Gate-Source Voltage		V _{GSS}	±8	V
Drain Current	Continuous (Note 1, 2)	I _D	750	mA
	Pulsed	I _{DM}	1500	mA
Power Dissipation (Note 2)		P _D	260	mW
Junction Temperature		T _J	+150	°C
Storage 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	RATING	UNIT
Junction to Ambient	θ _{JA}	480	°C/W

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

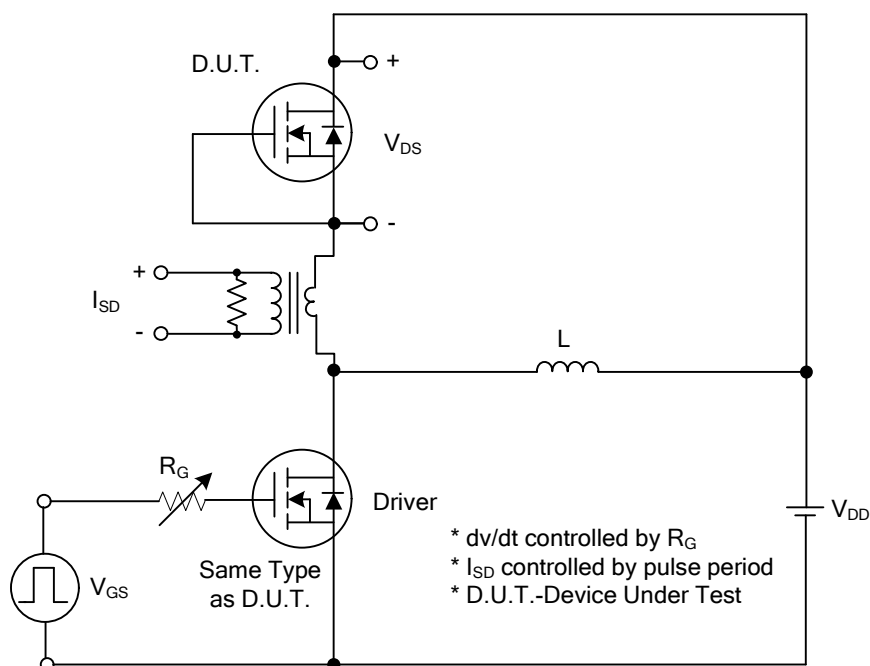
■ ELECTRICAL CHARACTERISTICS (T_J = 25°C, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	I _D =250μA, V _{GS} =0V	20			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =20V, V _{GS} =0V			1	μA
Gate- Source Leakage Current	Forward	I _{GSS}	V _{GS} =+8V, V _{DS} =0V			+100	nA
	Reverse		V _{GS} =-8V, V _{DS} =0V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	0.3		1.0	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =4.5V, I _D =600mA			300	mΩ
			V _{GS} =2.5V, I _D =200mA			450	mΩ
			V _{GS} =1.8V, I _D =100mA			600	mΩ
			V _{GS} =1.5V, I _D =50mA			850	mΩ
SWITCHING PARAMETERS							
Input Capacitance		C _{ISS}	V _{DS} =10V, V _{GS} =0V, f=1MHz		38		pF
Output Capacitance		C _{OSS}			18		pF
Reverse Transfer Capacitance		C _{RSS}			11		pF
Total Gate Charge		Q _G	V _{DS} =10V, V _{GS} =4.5V, I _D =0.75A		3.8		nC
Gate to Source Charge		Q _{GS}			0.6		nC
Gate to Drain Charge		Q _{GD}			0.4		nC
Turn-ON Delay Time		t _{D(ON)}	V _{DD} =10V, V _{GS} =4.5V I _D =0.75A,, R _G =3.3Ω (Note 1, 2)		2.5		ns
Rise Time		t _R			16		ns
Turn-OFF Delay Time		t _{D(OFF)}			5		ns
Fall Time		t _F			60		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I _S				750	mA
Maximum Body-Diode Pulsed Current		I _{SM}				1500	mA
Drain-Source Diode Forward Voltage		V _{SD}	I _S =0.5A, V _{GS} =0V			1.3	V

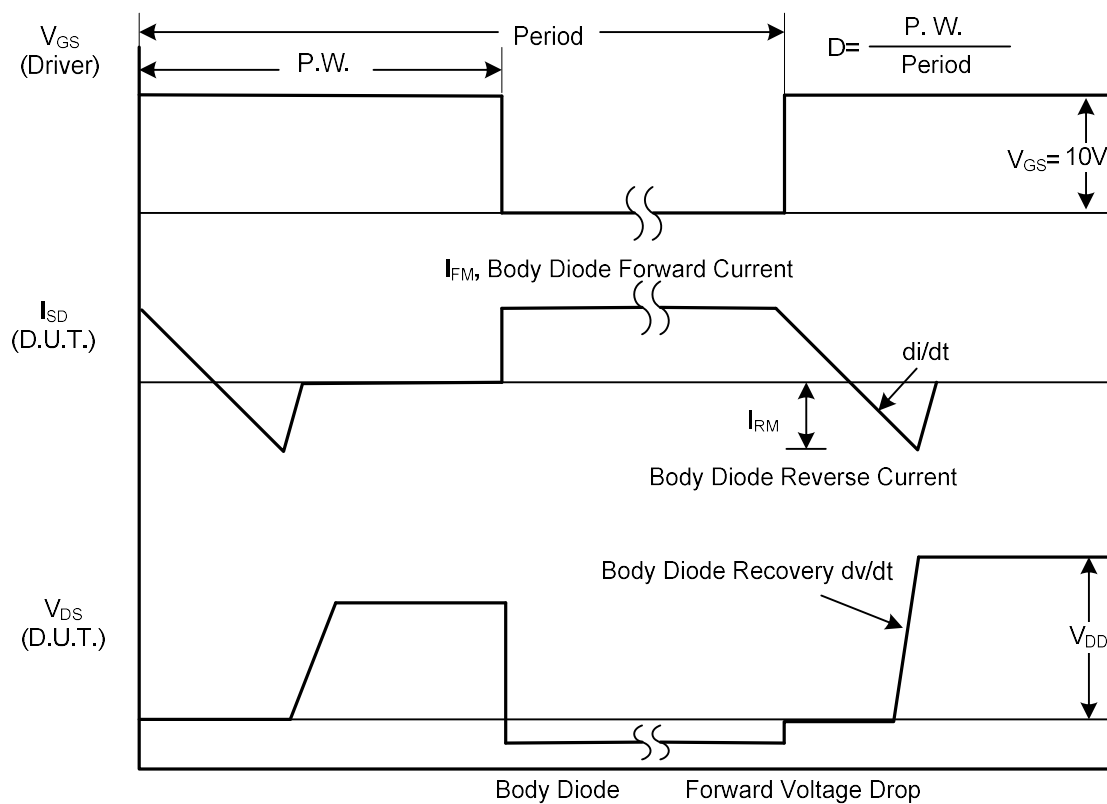
Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.

2. Guaranteed by design, not subject to production testing.

■ TEST CIRCUITS AND WAVEFORMS

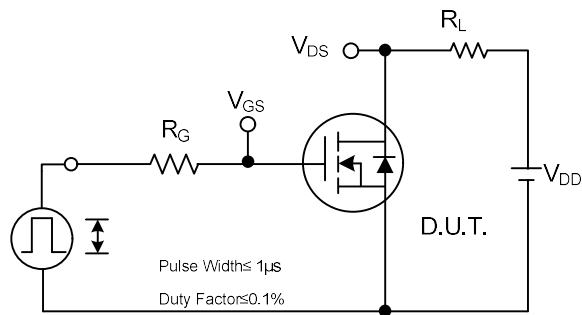


Peak Diode Recovery dv/dt Test Circuit

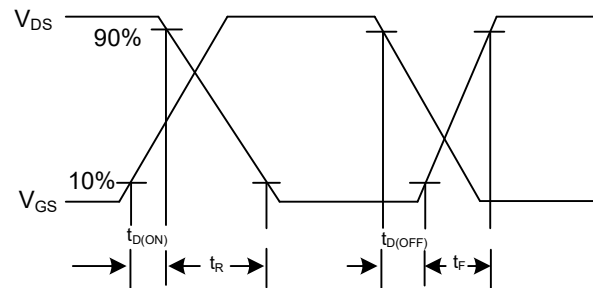


Peak Diode Recovery dv/dt Waveforms

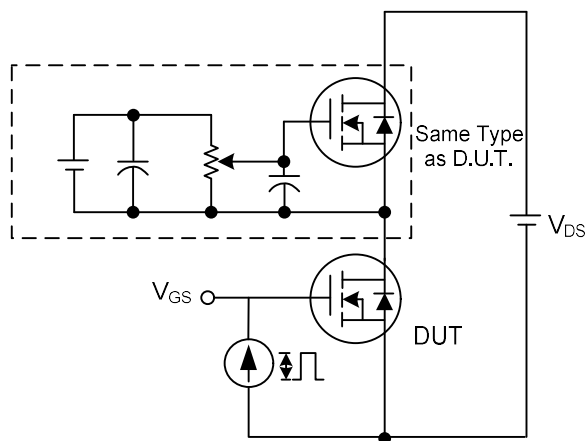
■ TEST CIRCUITS AND WAVEFORMS



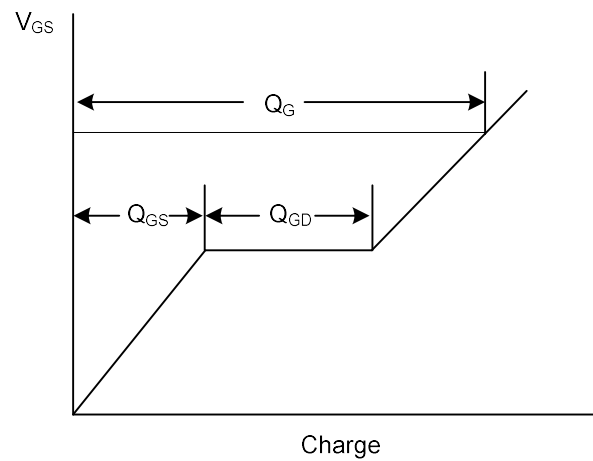
Switching Test Circuit



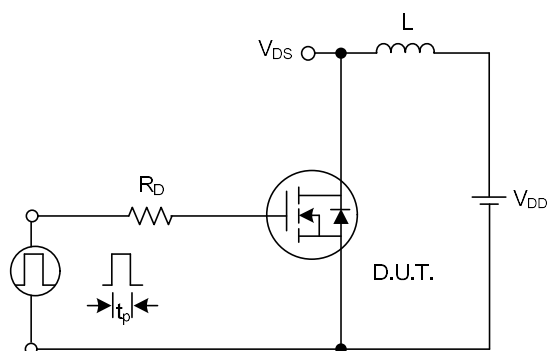
Switching Waveforms



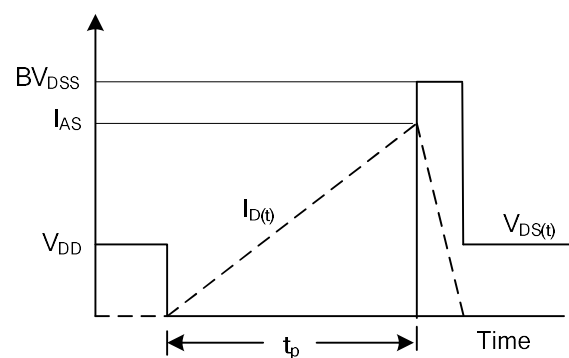
Gate Charge Test Circuit



Gate Charge Waveform

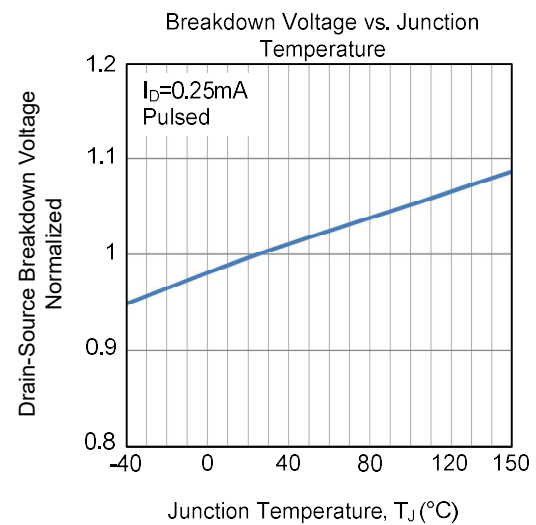
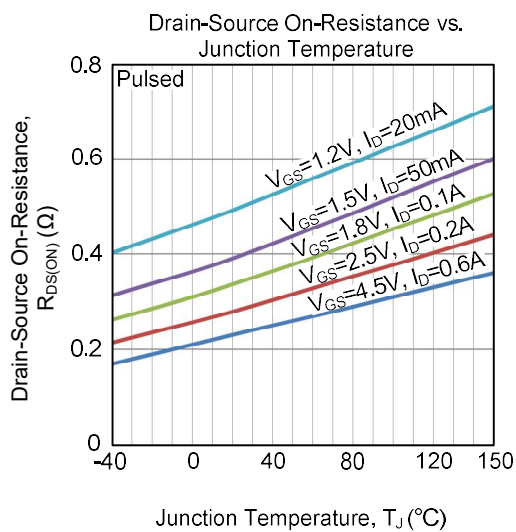
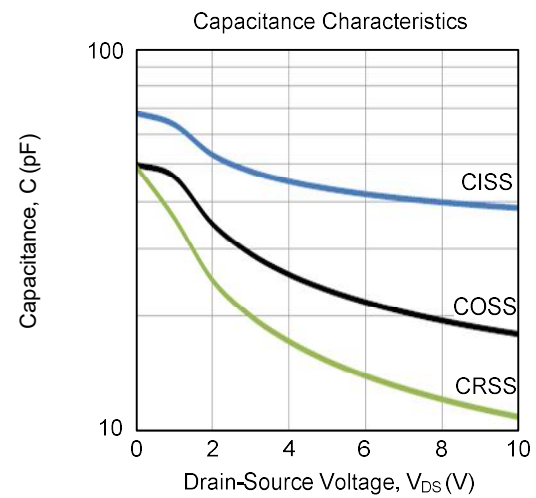
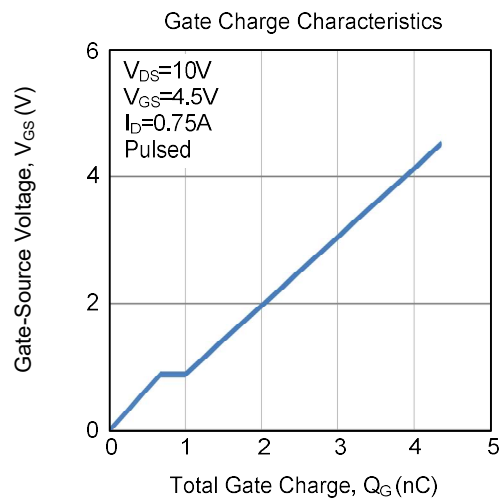
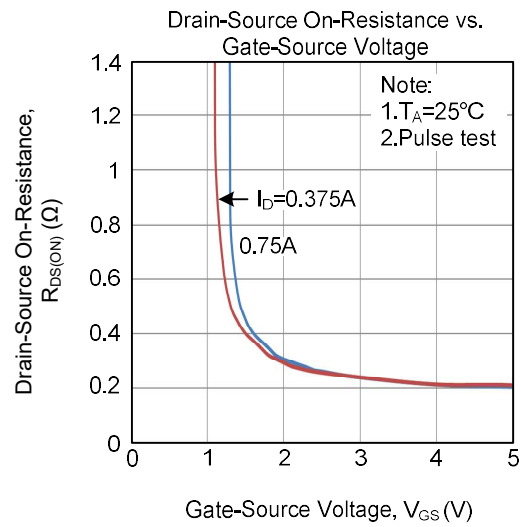
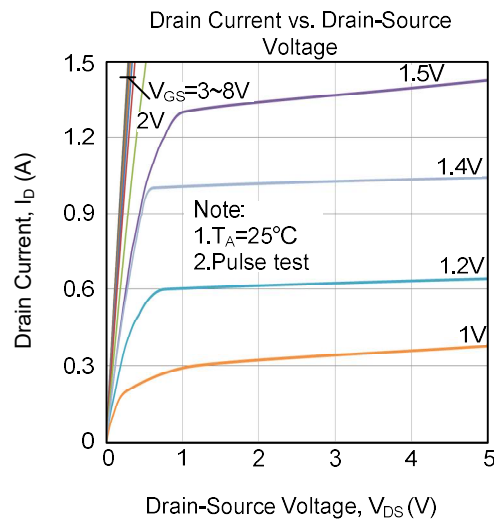


Unclamped Inductive Switching Test Circuit

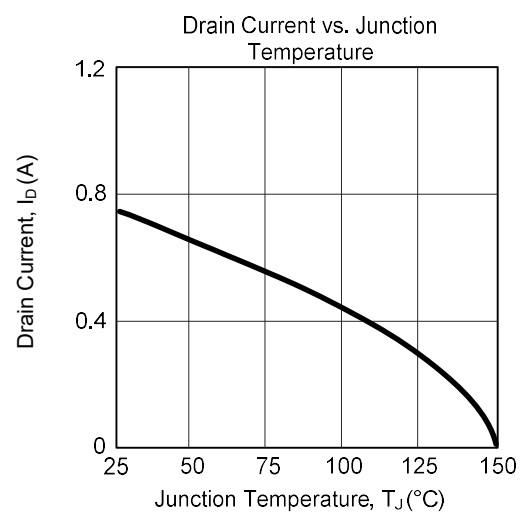
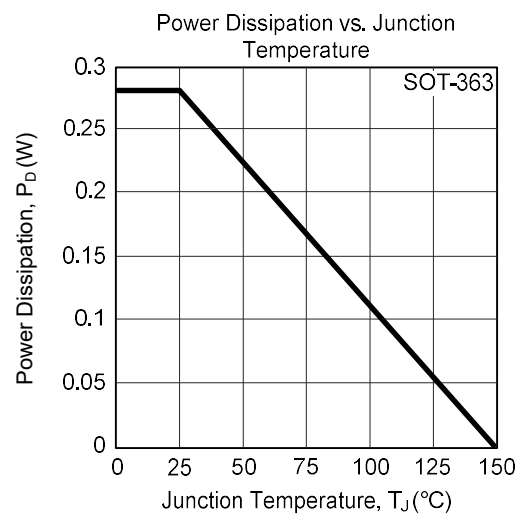
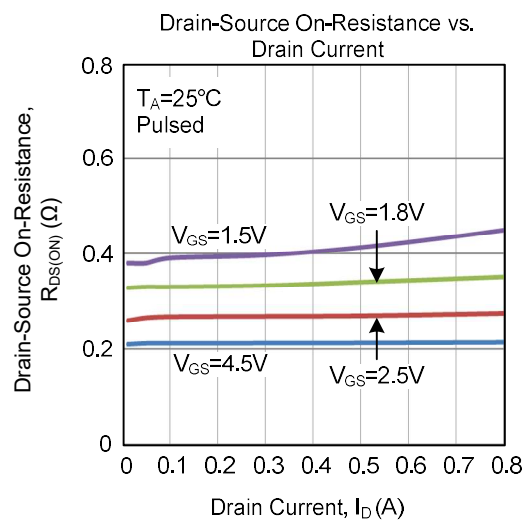
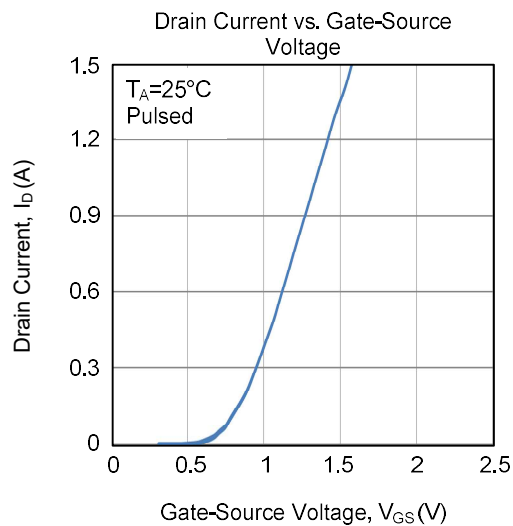
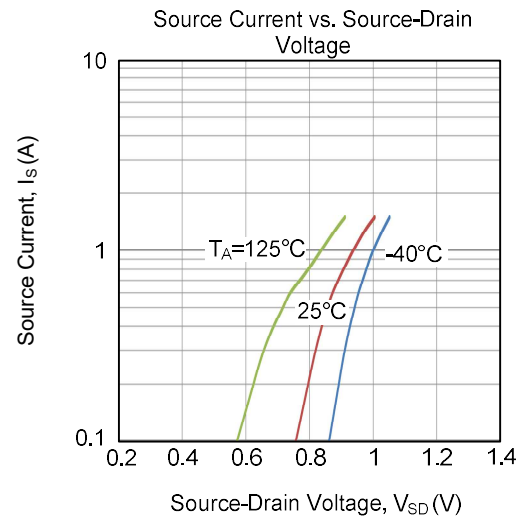
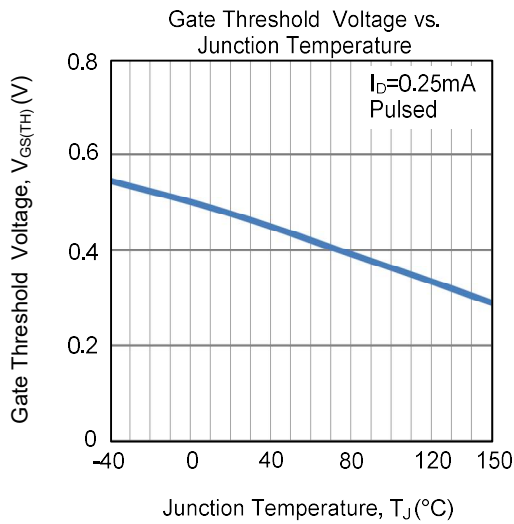


Unclamped Inductive Switching Waveforms

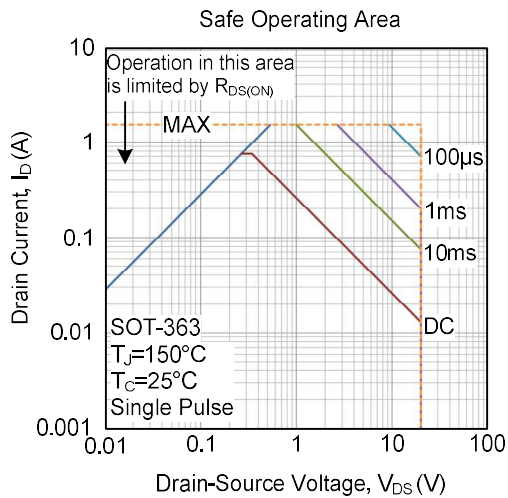
TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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