



UT10P02V

POWER MOSFET

-10A, -20V P-CHANNEL POWER MOSFET

DESCRIPTION

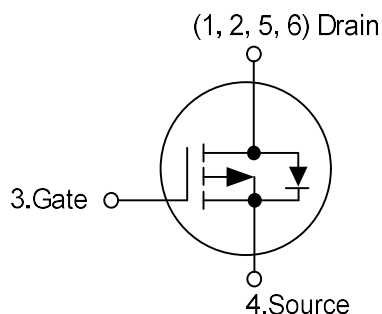
The UTC **UT10P02V** is a P-channel MOSFET, it uses UTC's advanced technology to provide the customers with a minimum on state resistance and low gate charge, etc.

The UTC **UT10P02V** is suitable for load switch and battery protection applications.

FEATURES

- * $R_{DS(ON)} \leq 25 \text{ m}\Omega$ @ $V_{GS} = -4.5\text{V}$, $I_D = -8.0\text{A}$
- * $R_{DS(ON)} \leq 30 \text{ m}\Omega$ @ $V_{GS} = -2.5\text{V}$, $I_D = -5.0\text{A}$
- * $R_{DS(ON)} \leq 39 \text{ m}\Omega$ @ $V_{GS} = -1.8\text{V}$, $I_D = -2.0\text{A}$
- * Improved dv/dt capability
- * Fast switching
- * Suit for -1.8V gate drive applications

SYMBOL

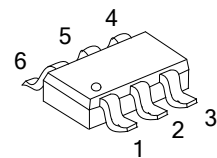


ORDERING INFORMATION

Ordering Number		Package	Pin Assignment						Packing
Lead Free	Halogen Free		1	2	3	4	5	6	
UT10P02VL-AG6-R	UT10P02VG-AG6-R	SOT-26	D	D	G	S	D	D	Tape Reel

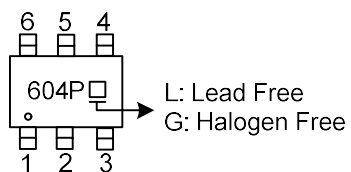
Note: Pin Assignment: D: Drain G: Gate S: Source

UT10P02VG-AG6-R	(1)Packing Type	(1) R: Tape Reel
	(2)Package Type	(2) AG6: SOT-26
	(3)Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free



SOT-26

■ MARKING



■ ABSOLUTE MAXIMUM RATING (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	DC	I _D	-10	A
	Pulsed (Note 2)	I _{DM}	-20	A
Avalanche Energy	Single Pulsed (Note 3)	E _{AS}	47	mJ
Power Dissipation		P _D	1.5	W
Junction Temperature		T _J	+150	°C
Storage Temperature Range		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.

3. L = 1mH, I_{AS} = -9.75A, V_{DD} = -20V, R_G = 25 Ω Starting T_J = 25°C.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient		θ _{JA}	104	°C/W
Junction to Case		θ _{JC}	78	°C/W

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

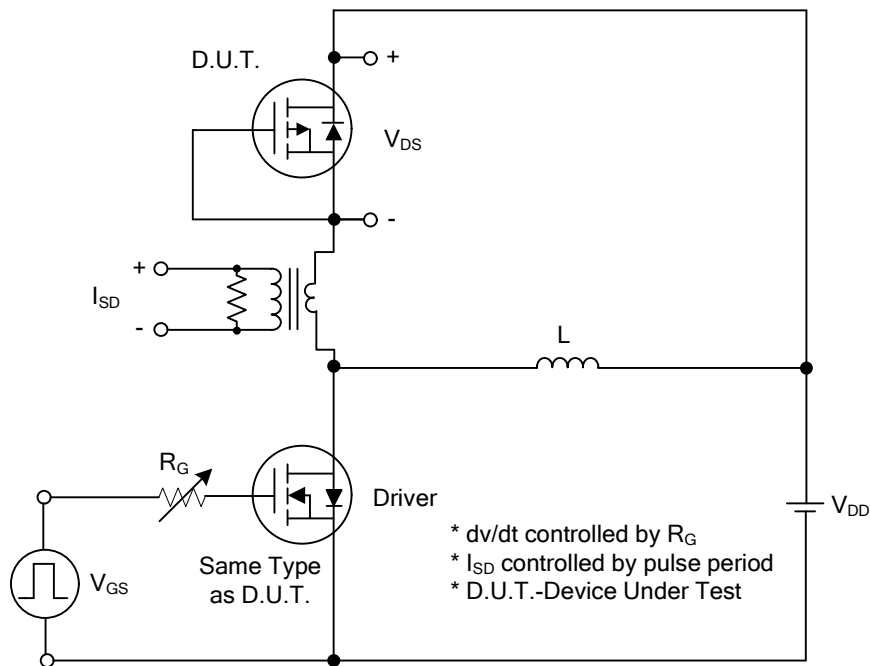
■ ELECTRICAL CHARACTERISTICS (T_A=25°C, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	V _{GS} =0V, I _D =-250μA	-20			V
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		-1.5	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =-4.5V, I _D =-8.0A			25	mΩ
			V _{GS} =-2.5V, I _D =-5.0A			30	mΩ
			V _{GS} =-1.8V, I _D =-2.0A			39	mΩ
			DYNAMIC PARAMETERS				
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =-10V, f=1.0MHz		2140		pF
Output Capacitance		C _{OSS}			462		pF
Reverse Transfer Capacitance		C _{RSS}			406		pF
SWITCHING PARAMETERS							
Total Gate Charge		Q _G	V _{DS} =-16V, V _{GS} =-8V, I _D =-10A, (Note 1, 2)		57		nC
Gate to Source Charge		Q _{GS}			4		nC
Gate to Drain Charge		Q _{GD}			12		nC
Turn-ON Delay Time		t _{D(ON)}	V _{DS} =-10V, V _{GS} =-8V, I _D =-10A, R _G =3Ω (Note 1, 2)		6		ns
Rise Time		t _R			18		ns
Turn-OFF Delay Time		t _{D(OFF)}			132		ns
Fall-Time		t _F			78		ns
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Continuous Drain-Source Diode Forward Current		I _S				-10	A
Maximum Pulsed Drain-Source Diode Forward Current		I _{SM}				-20	A
Diode Forward Voltage		V _{SD}	I _F =-10A, V _{GS} =0V			-1.4	V

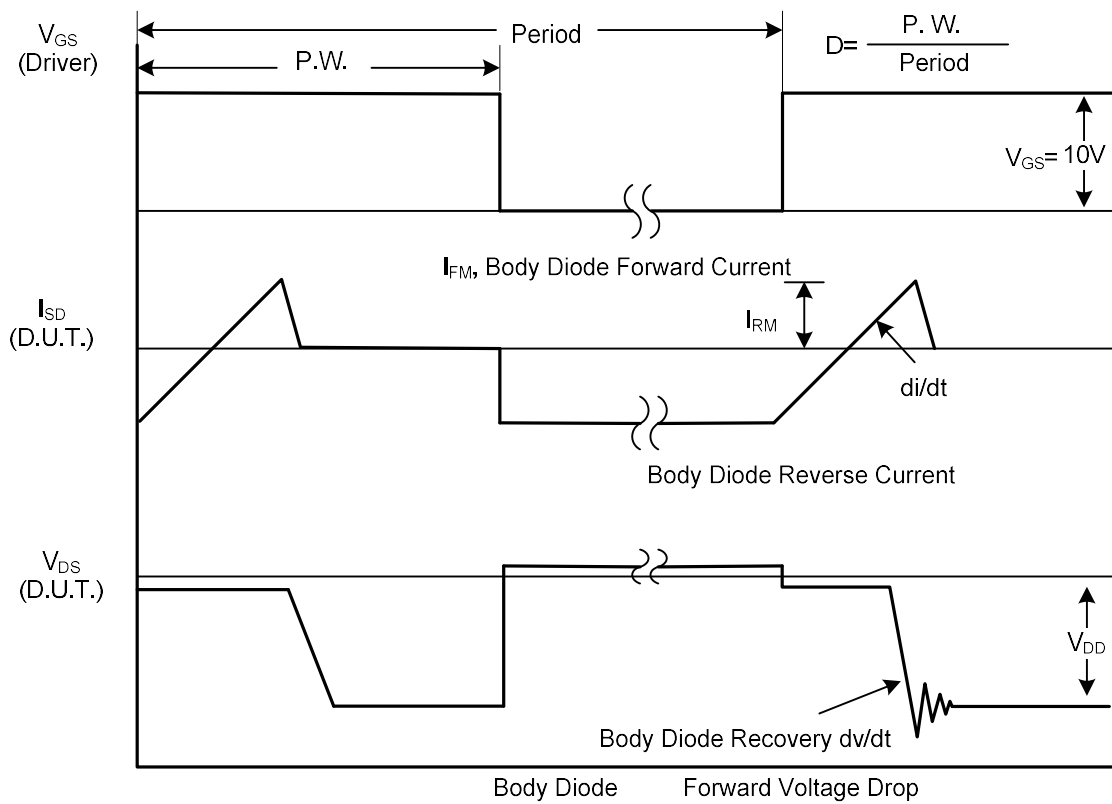
Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

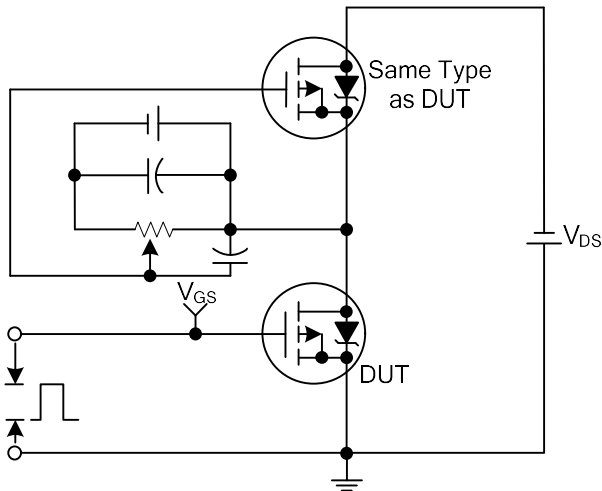


Peak Diode Recovery dv/dt Test Circuit

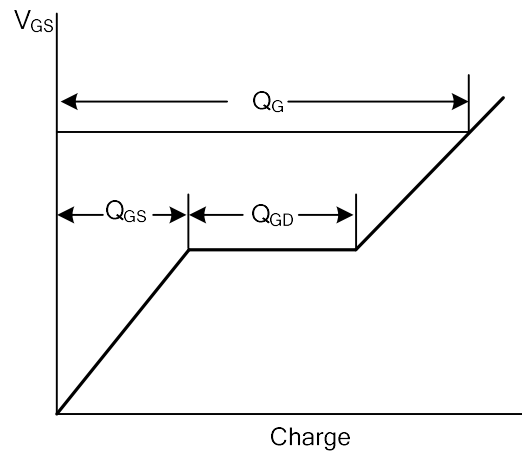


Peak Diode Recovery dv/dt Waveforms

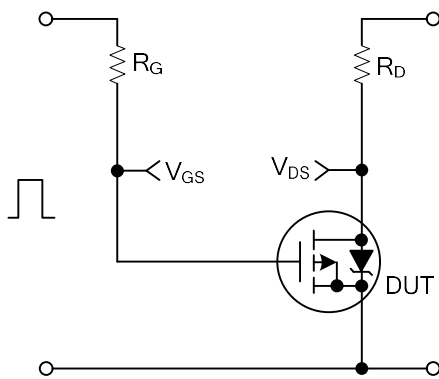
■ TEST CIRCUITS AND WAVEFORMS



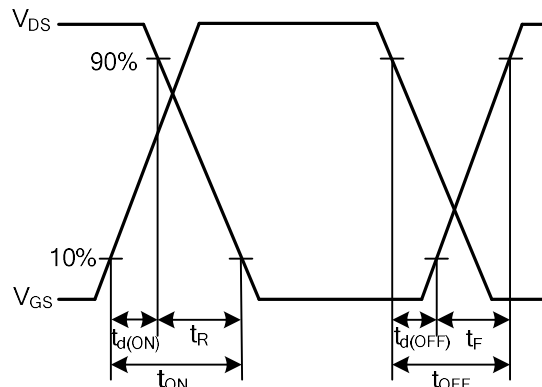
Gate Charge Test Circuit



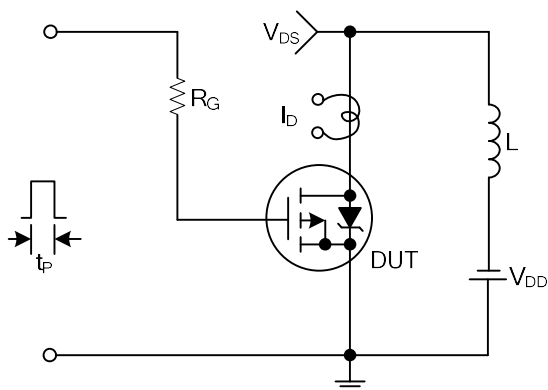
Gate Charge Waveforms



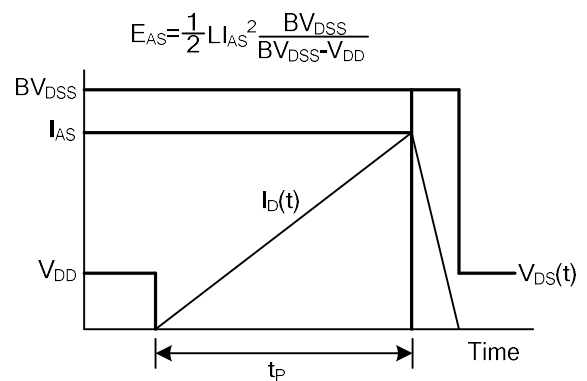
Resistive Switching Test Circuit



Resistive Switching Waveforms

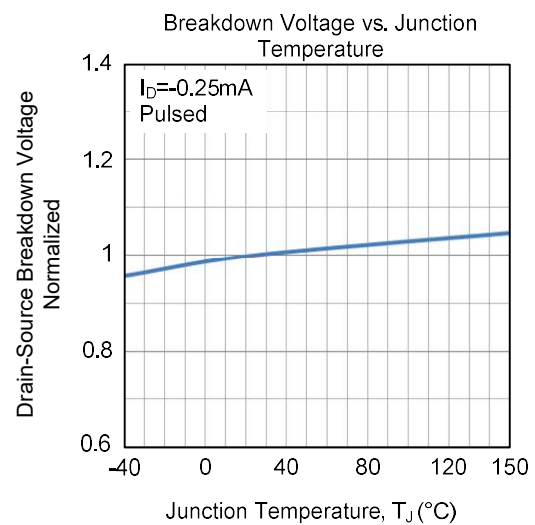
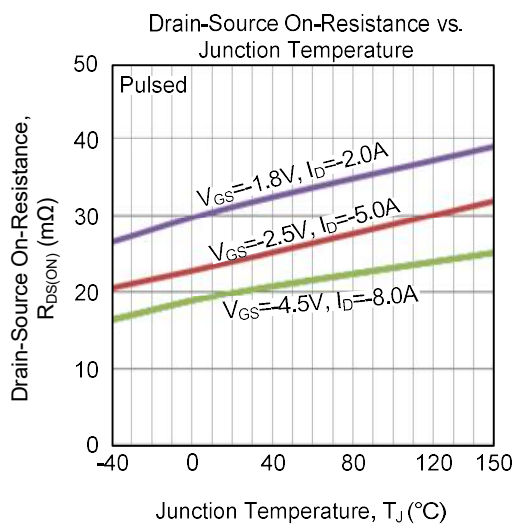
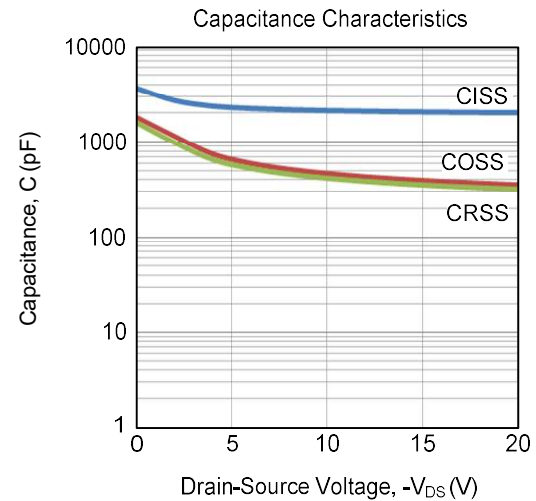
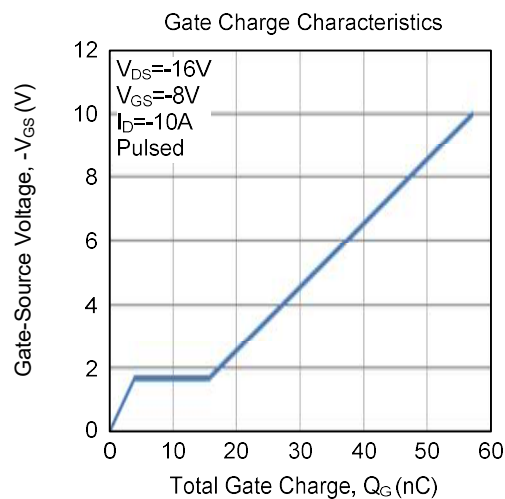
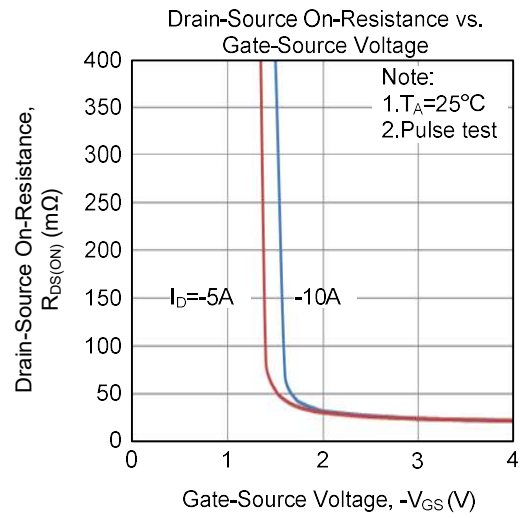
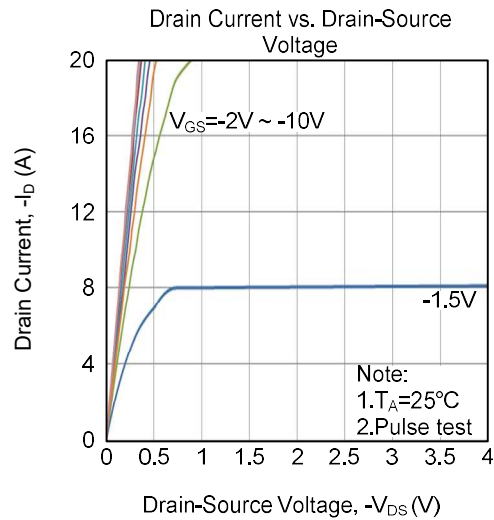


Unclamped Inductive Switching Test Circuit

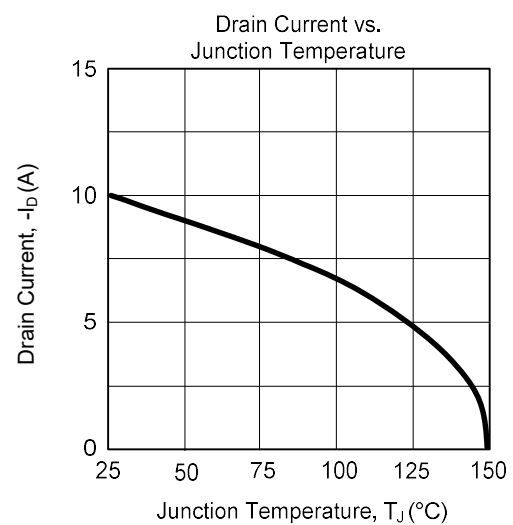
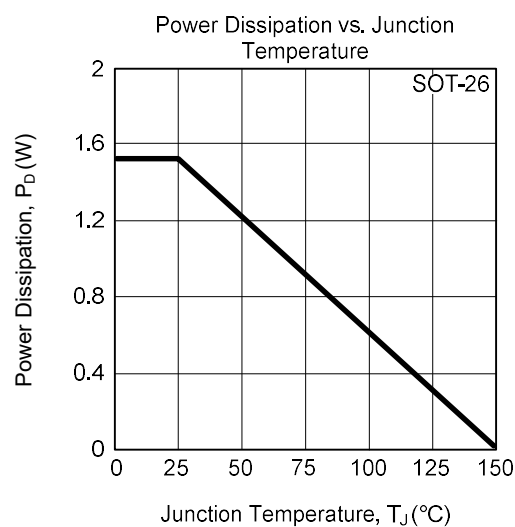
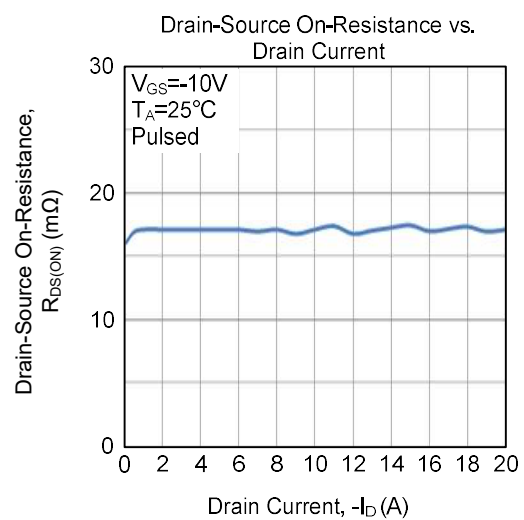
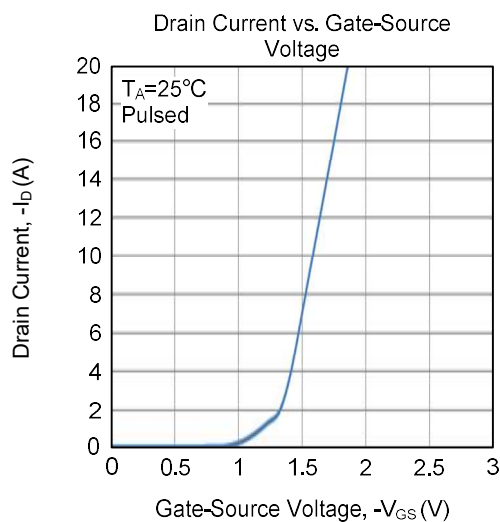
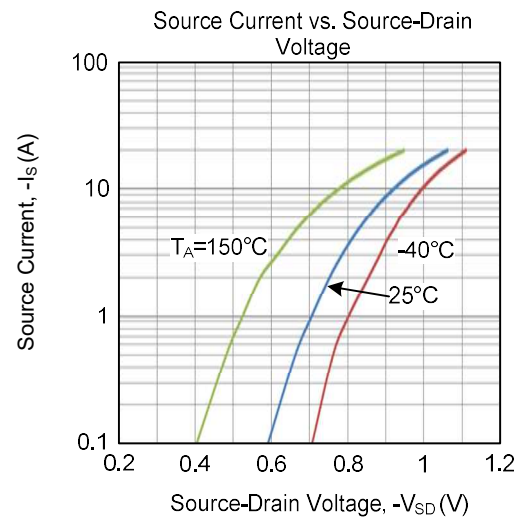
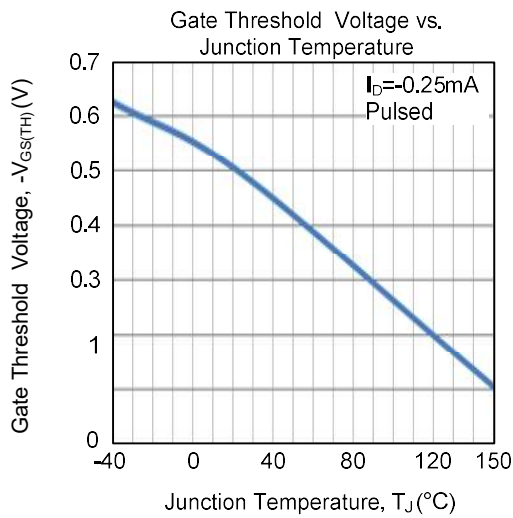


Unclamped Inductive Switching Waveforms

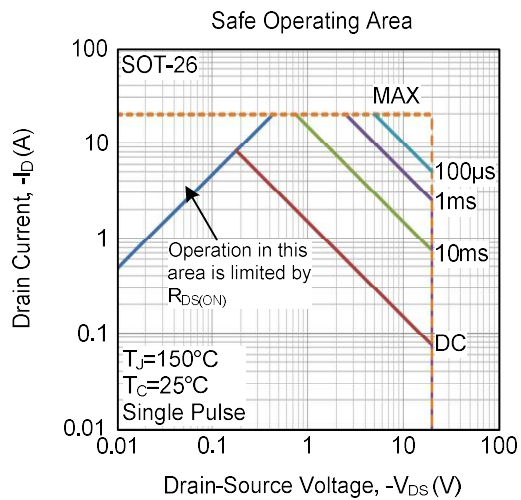
TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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