



UT80P06

Power MOSFET

-80A, -60V P-CHANNEL (D-S) POWER MOSFET

DESCRIPTION

The UTC **UT80P06** is a P-channel power MOSFET using UTC's advanced technology to provide the customers with high switching speed and a minimum on-state resistance, and it can also withstand high energy in the avalanche.

This UTC **UT80P06** is suitable for load switch, etc.

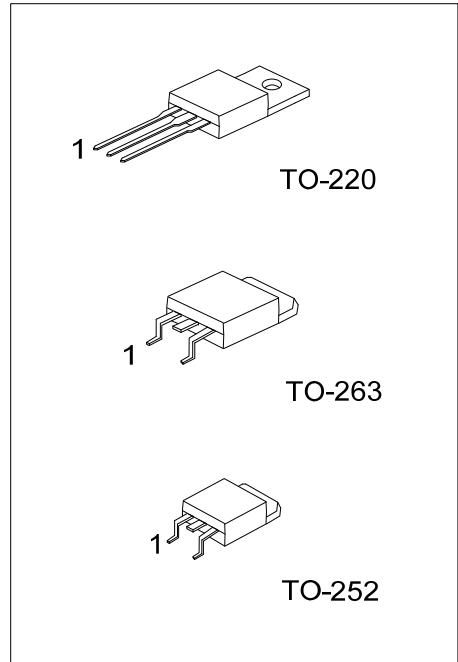
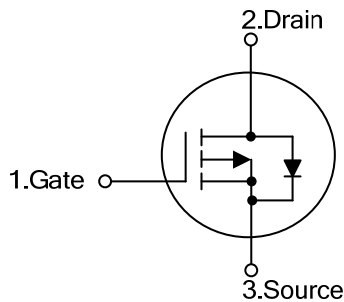
FEATURES

* $R_{DS(ON)} \leq 14 \text{ m}\Omega$ @ $V_{GS} = -10\text{V}$, $I_D = -40\text{A}$

$R_{DS(ON)} \leq 18 \text{ m}\Omega$ @ $V_{GS} = -4.5\text{V}$, $I_D = -40\text{A}$

* High Switching Speed

SYMBOL



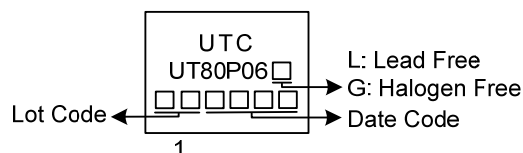
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UT80P06L-TA3-T	UT80P06G-TA3-T	TO-220	G	D	S	Tube
UT80P06L-TN3-R	UT80P06G-TN3-R	TO-252	G	D	S	Tape Reel
UT80P06L-TQ2-T	UT80P06G-TQ2-T	TO-263	G	D	S	Tube
UT80P06L-TQ2-R	UT80P06G-TQ2-R	TO-263	G	D	S	Tape Reel

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

UT80P06G-TA3-T		(1) Packing Type	(1) T: Tube, R: Tape Reel
		(2) Package Type	(2) TA3: TO-220, TN3: TO-252, TQ2: TO-263
		(3) Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free

MARKING



■ ABSOLUTE MAXIMUM RATINGS ($T_A=25^\circ\text{C}$, unless otherwise specified)

PARAMETER			SYMBOL	RATINGS	UNIT
Drain-Source Voltage			V _{DSS}	-60	V
Gate-Source Voltage			V _{GSS}	±20	V
Drain Current	Continuous (T _J =175°C)	T _C =25°C	I _D	-80	A
	Pulsed (Note 2)		I _{DM}	-160	A
Avalanche Energy		Single Pulsed (Note 3)	E _{AS}	185	mJ
Peak Diode Recovery dv/dt (Note 4)			dv/dt	3.1	V/ns
Power Dissipation (T _C =25°C)	TO-220/TO-263		P _D	160	W
	TO-252			60	W
Junction Temperature			T _J	-55 ~ +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.

3. $L = 0.1\text{mH}$, $I_{AS} = -61\text{A}$, $V_{DD} = -30\text{V}$, $R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$

4. $I_{SD} \leq -30\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^\circ\text{C}$

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220/TO-263	θ_{JA}	62.5	$^\circ\text{C}/\text{W}$
	TO-252		110	$^\circ\text{C}/\text{W}$
Junction to Case	TO-220/TO-263	θ_{JC}	0.78	$^\circ\text{C}/\text{W}$
	TO-252		2.08 (Note)	$^\circ\text{C}/\text{W}$

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

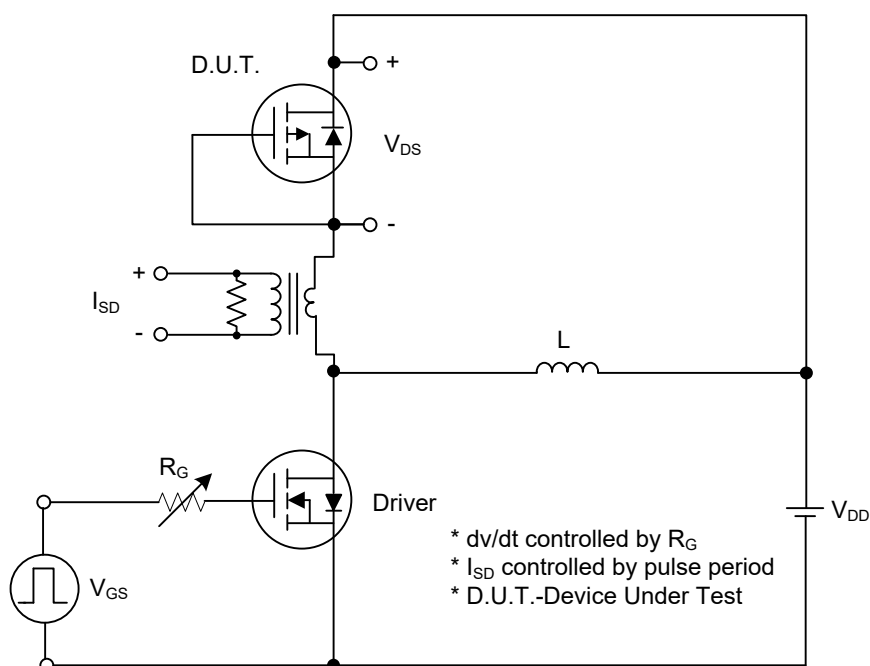
■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	V _{GS} =0V, I _D =-250μA	-60			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =-60V, V _{GS} =0V			-1	μA
Gate- Source Leakage Current	Forward	I _{GSS}	V _{GS} =+20V, V _{DS} =0V			+100	nA
	Reverse		V _{GS} =-20V, V _{DS} =0V			-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-State Resistance (Note 1)		R _{DS(ON)}	V _{GS} =-10V, I _D =-40A			14	mΩ
			V _{GS} =-4.5V, I _D =-40A			18	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =-25V, f=1MHz		6741		pF
Output Capacitance		C _{OSS}			571		pF
Reverse Transfer Capacitance		C _{RSS}			400		pF
SWITCHING PARAMETERS							
Total Gate Charge		Q _G	V _{DS} =-48V, V _{GS} =-10V, I _D =-80A, (Note1, 2)		68		nC
Gate to Source Charge		Q _{GS}			17		nC
Gate to Drain Charge		Q _{GD}			38		nC
Turn-ON Delay Time		t _{D(ON)}	V _{DD} =-30V, V _{GS} =-10V, I _D =-80A, R _G =3.3Ω (Note1, 2)		15		ns
Rise Time		t _R			22		ns
Turn-OFF Delay Time		t _{D(OFF)}			111		ns
Fall-Time		t _F			55		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I _S				-80	A
Maximum Body-Diode Pulsed Current		I _{SM}				-160	A
Drain-Source Diode Forward Voltage (Note 1)		V _{SD}	I _F =-80A, V _{GS} =0V			-1.4	V
Body Diode Reverse Recovery Time		t _{rr}	I _F =-30A, dI/dt=100A/μs		92		ns
Reverse Recovery Charge		Q _{rr}			175		nC

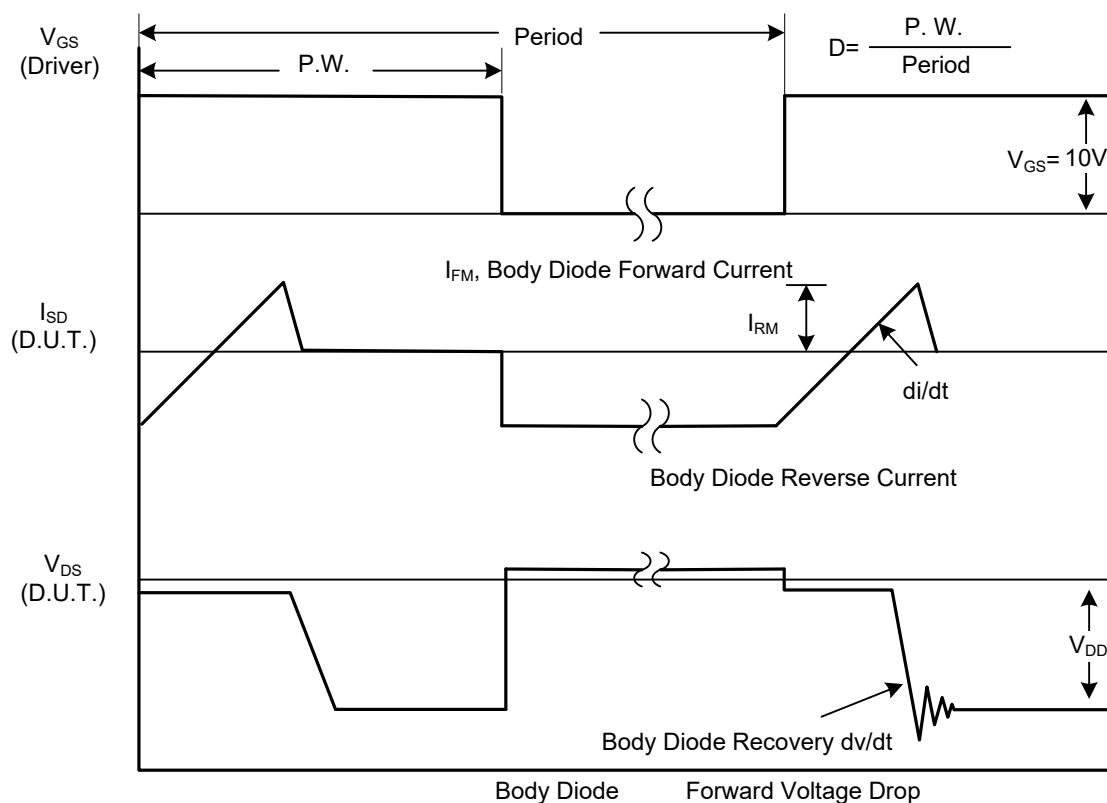
Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

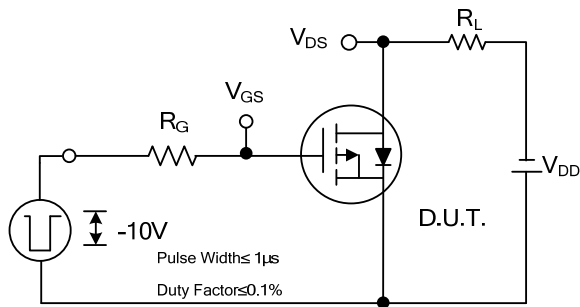


Peak Diode Recovery dv/dt Test Circuit

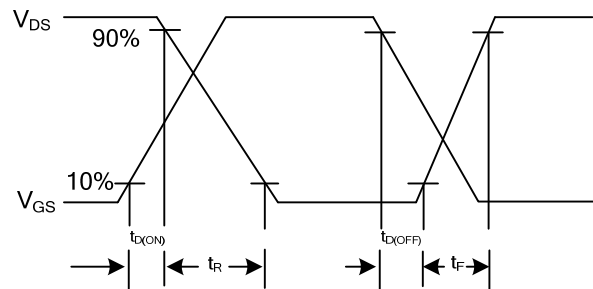


Peak Diode Recovery dv/dt Waveforms

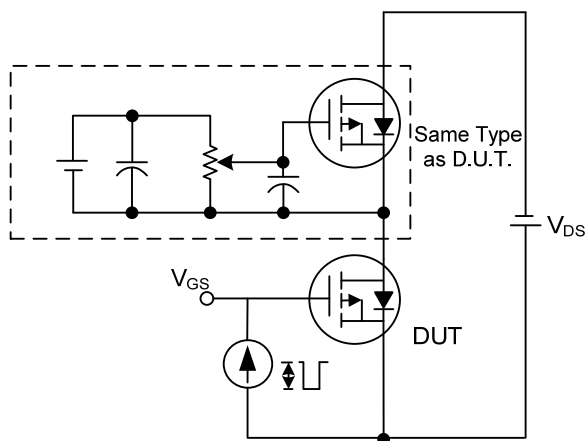
■ TEST CIRCUITS AND WAVEFORMS



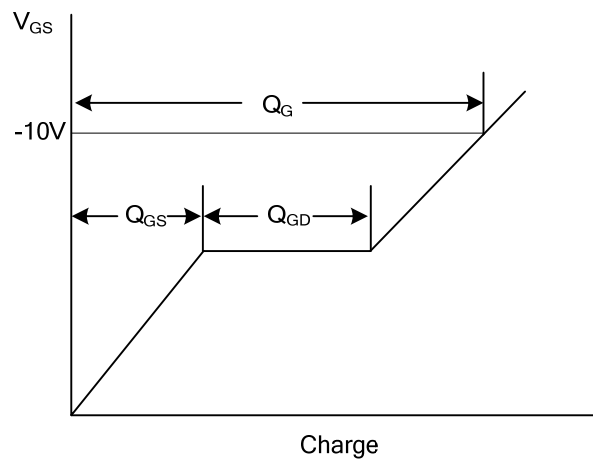
Switching Test Circuit



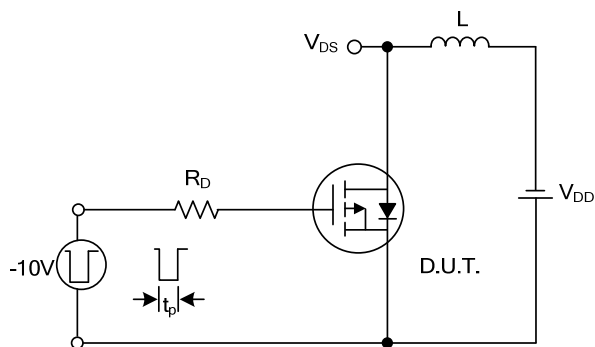
Switching Waveforms



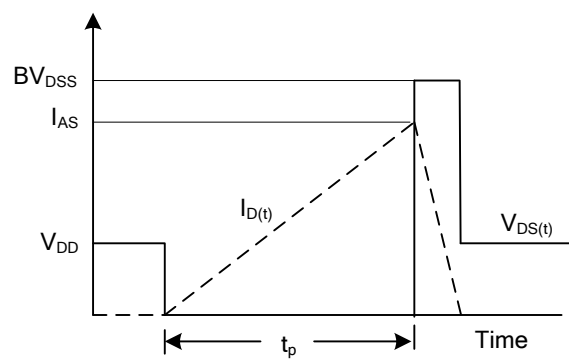
Gate Charge Test Circuit



Gate Charge Waveform

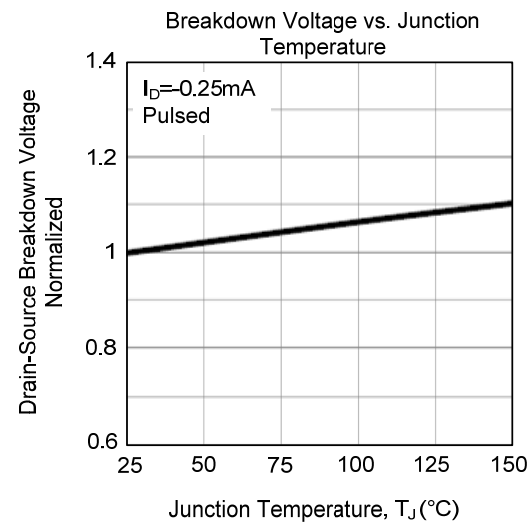
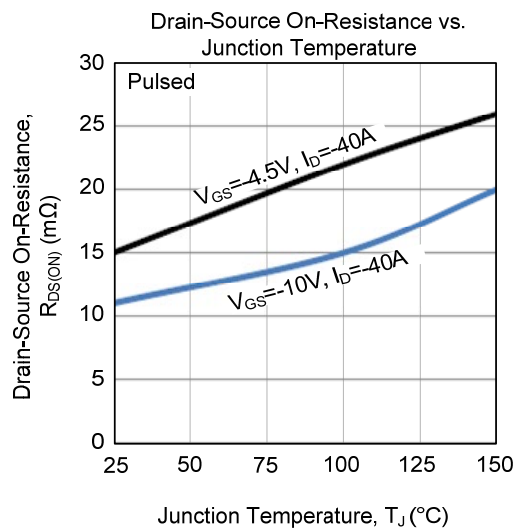
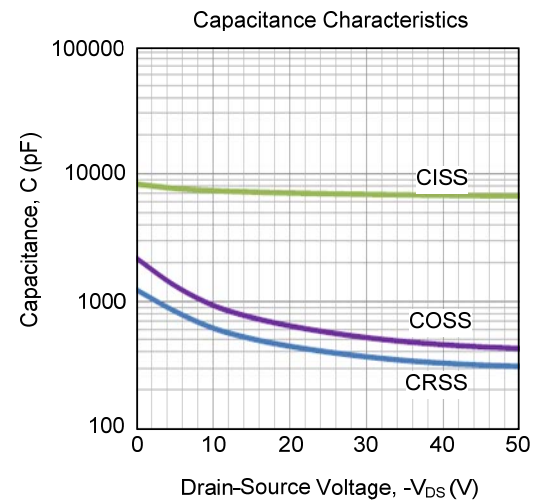
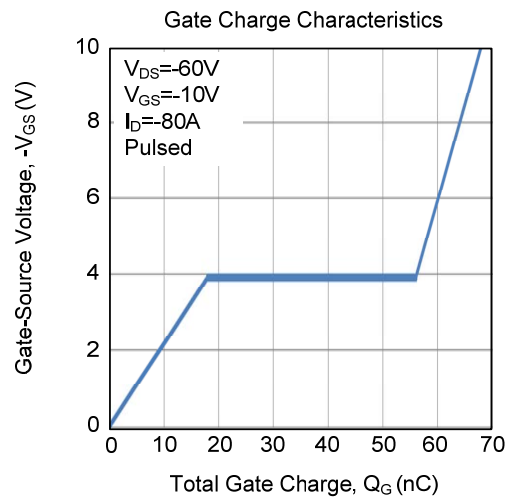
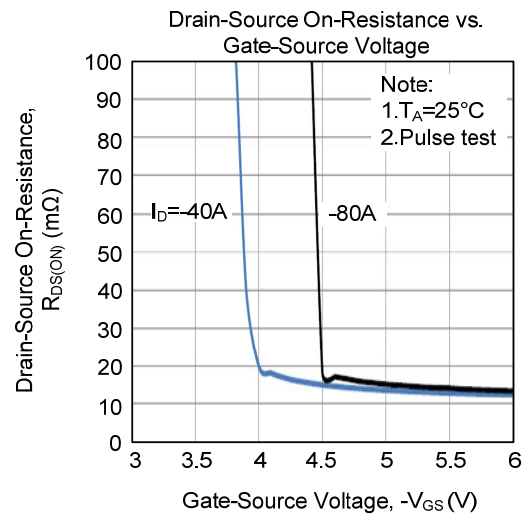
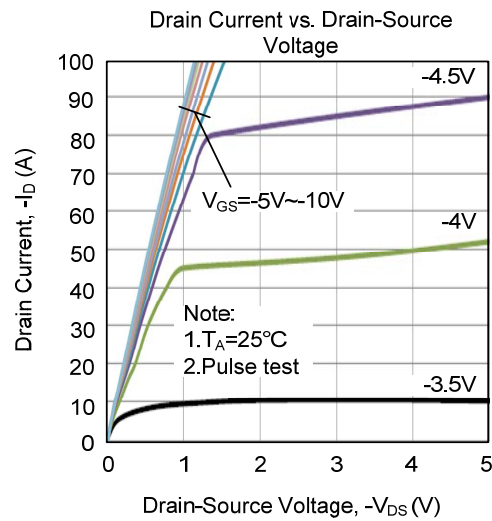


Unclamped Inductive Switching Test Circuit

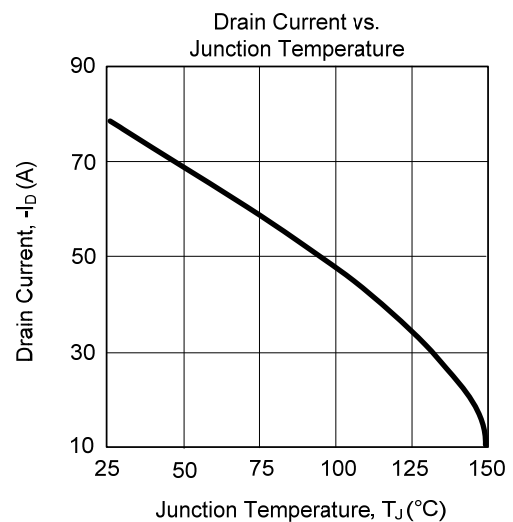
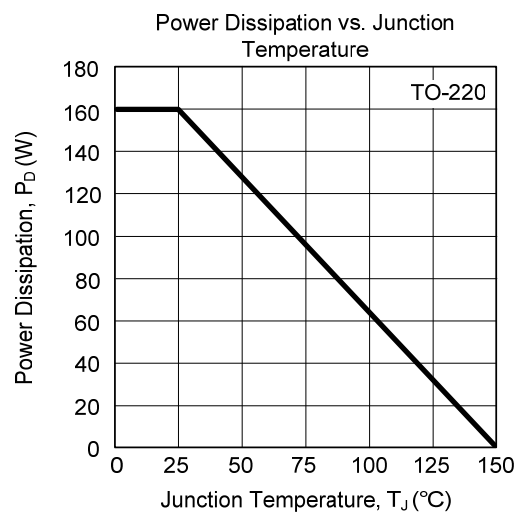
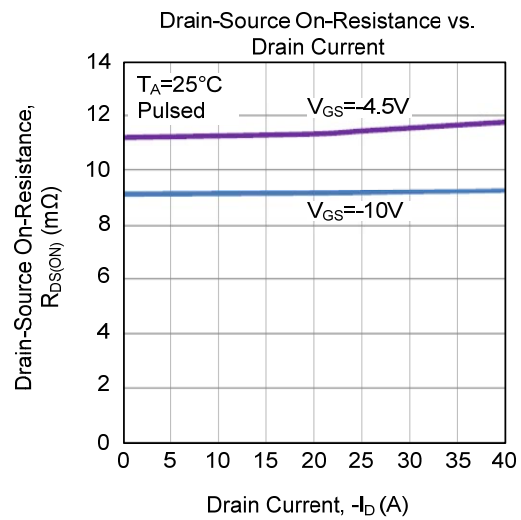
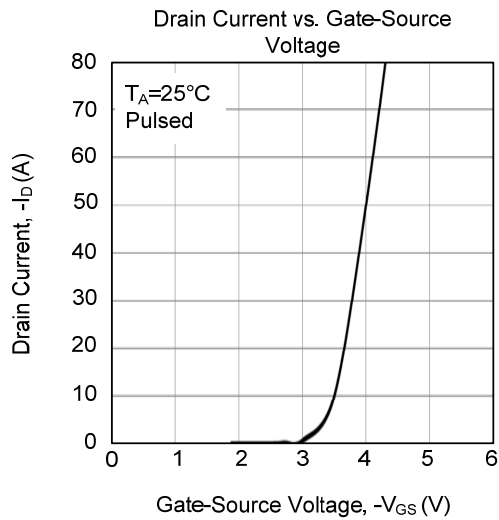
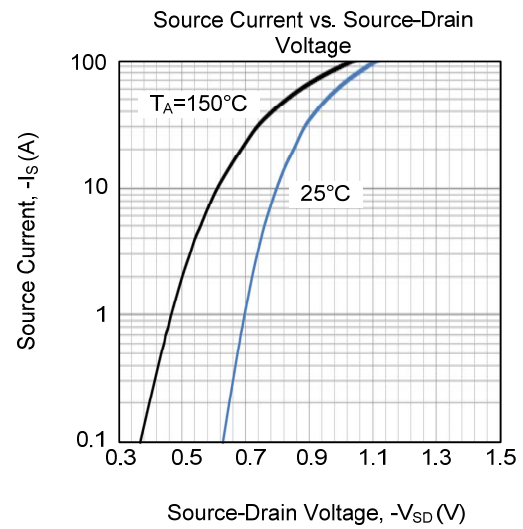
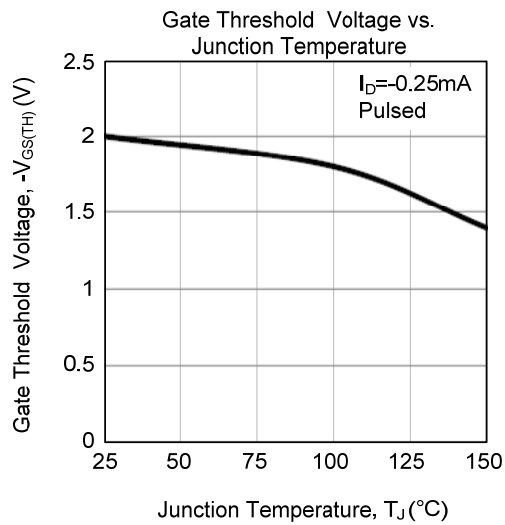


Unclamped Inductive Switching Waveforms

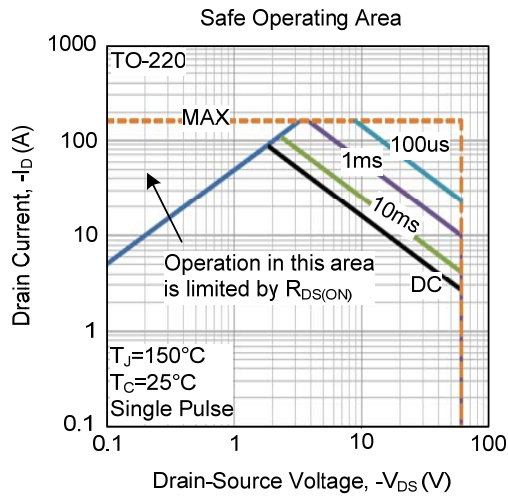
TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS (Cont.)



TYPICAL CHARACTERISTICS (Cont.)



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