



UT7407

Preliminary

Power MOSFET

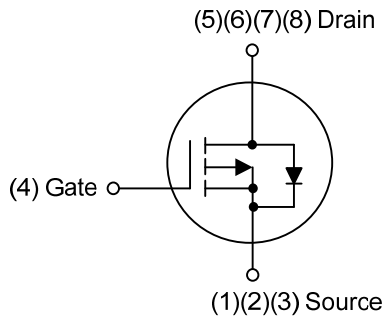
**-40A, -20V P-CHANNEL
POWER MOSFET****DESCRIPTION**

The UTC **UT7407** is a P-channel Power Mosfet, it uses UTC's advanced technology to provide the customers with a minimum on state resistance, etc.

The UTC **UT7407** is suitable for load switch and battery protection applications.

FEATURES

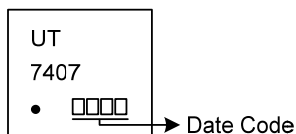
- * $R_{DS(ON)} \leq 9.5 \text{ m}\Omega$ @ $V_{GS} = -4.5\text{V}$, $I_D = -14\text{A}$
- $R_{DS(ON)} \leq 15.5 \text{ m}\Omega$ @ $V_{GS} = -2.5\text{V}$, $I_D = -13\text{A}$
- $R_{DS(ON)} \leq 20 \text{ m}\Omega$ @ $V_{GS} = -1.8\text{V}$, $I_D = -11\text{A}$
- * Low thermal resistance

SYMBOL**ORDERING INFORMATION**

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT7407L-P3030-R	UT7407G-P3030-R	PDFN3×3	S	S	S	G	D	D	D	D	Tape Reel

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

UT7407G-P3030-R		(1) Packing Type	(1) R: Tape Reel
		(2) Package Type	(2) P3030: PDFN3×3
		(3) Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free

MARKING

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

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V _{DSS}	-20	V
Gate-Source Voltage	V _{GSS}	±8	V
Continuous Drain Current	I _D	-40	A
Pulsed Drain Current (Note 2)	I _{DM}	-80	A
Avalanche Energy L=0.1mH (Note 3)	E _{AS}	96	mJ
Power Dissipation	P _D	32	W
Junction Temperature	T _J	-55 ~ +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. Pulse width limited by maximum junction temperature.

3. L = 0.1mH, I_{AS} = -43.8A, V_{DD} = -50V, R_G = 25Ω, Starting T_J = 25°C.

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ _{JA}	75	°C/W
Junction to Case	θ _{JC}	3.9	°C/W

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

2. The data tested by pulsed, pulse width ≤ 300μs, duty cycle ≤ 2%.

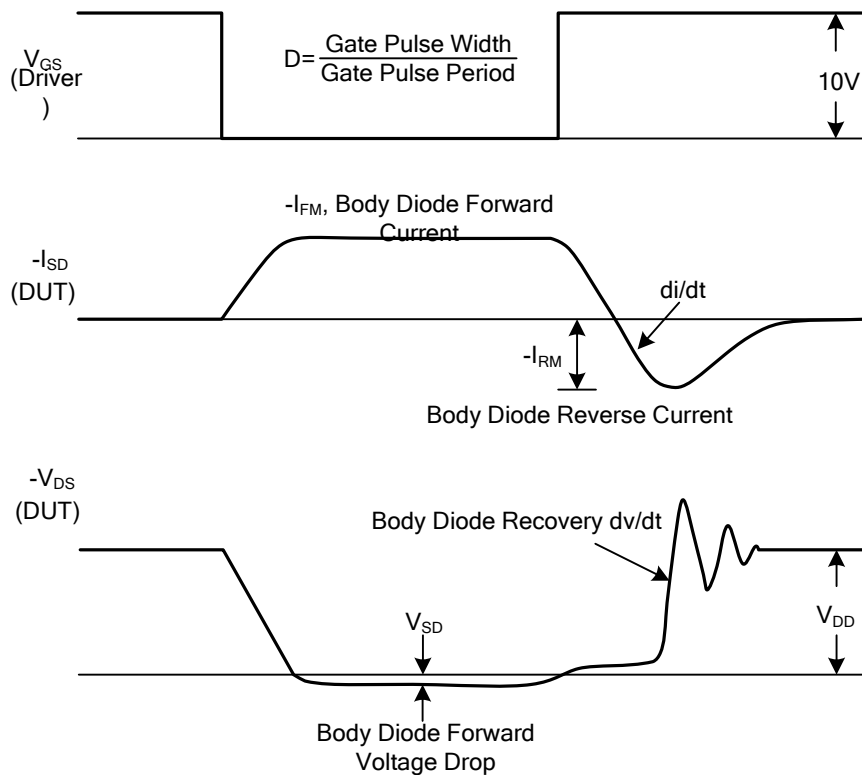
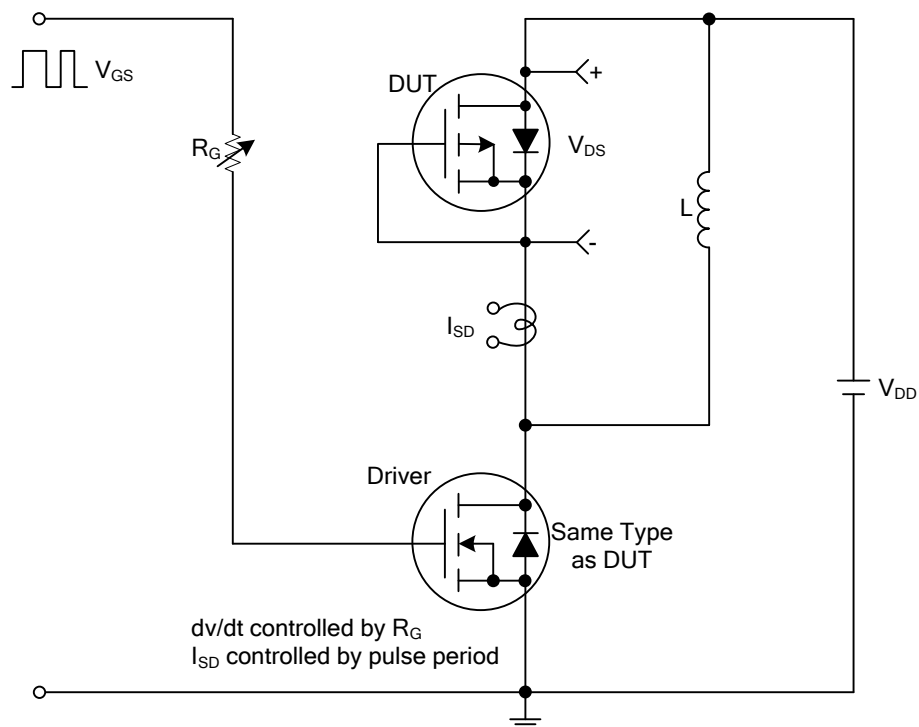
■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
STATIC PARAMETERS						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D =-250μA, V _{GS} =0V	-20			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-20V, V _{GS} =0V			-1	μA
Gate-Source Leakage Current	I _{GSS}	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		-0.9	V
Static Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =-4.5V, I _D =-14A			9.5	mΩ
		V _{GS} =-2.5V, I _D =-13A			15.5	mΩ
		V _{GS} =-1.8V, I _D =-11A			20	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	V _{GS} =0V, V _{DS} =-10V, f=1.0MHz		3834		pF
Output Capacitance	C _{OSS}			910		pF
Reverse Transfer Capacitance	C _{RSS}			772		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q _G	V _{GS} =-4.5V, V _{DS} =-16V, I _D =-40A		48		nC
Gate to Source Charge	Q _{GS}			4		nC
Gate to Drain Charge	Q _{GD}			21		nC
Turn-ON Delay Time	t _{D(ON)}	V _{DD} =-10V, V _{GS} =-4.5V, I _D =-40A, R _G =3Ω (Note 1, 2)		14		ns
Rise Time	t _R			23		ns
Turn-OFF Delay Time	t _{D(OFF)}			124		ns
Fall-Time	t _F			116		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current (Note)	I _S				-40	A
Diode Forward Voltage	V _{SD}	I _S =-1.0A, V _{GS} =0V			-1.2	V

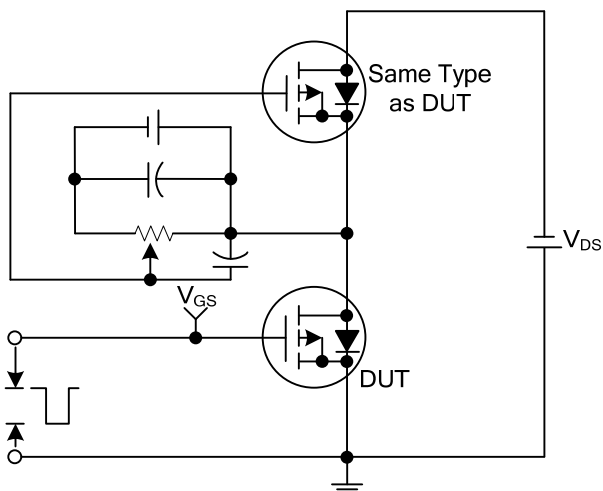
Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.

2. Essentially independent of operating temperature.

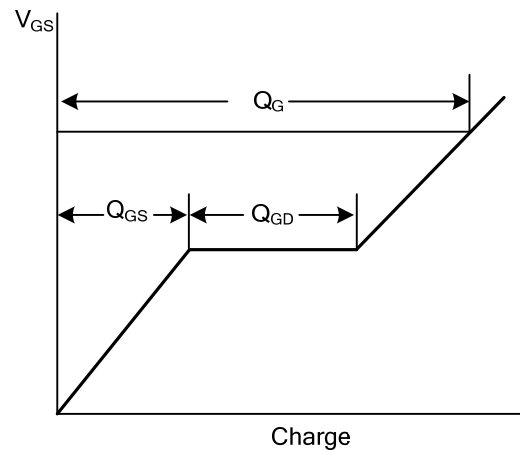
■ TEST CIRCUITS AND WAVEFORMS

Peak Diode Recovery dv/dt Test Circuit and Waveforms

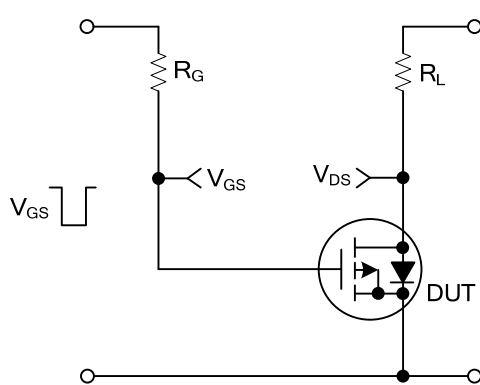
■ TEST CIRCUITS AND WAVEFORMS



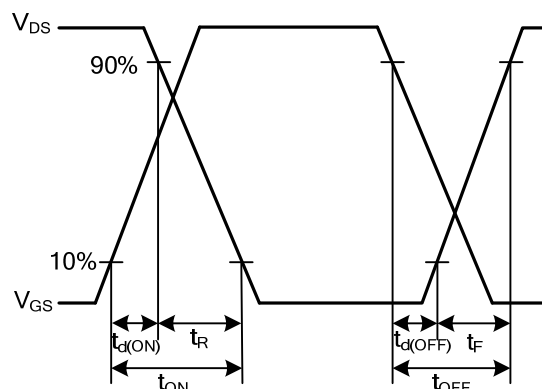
Gate Charge Test Circuit



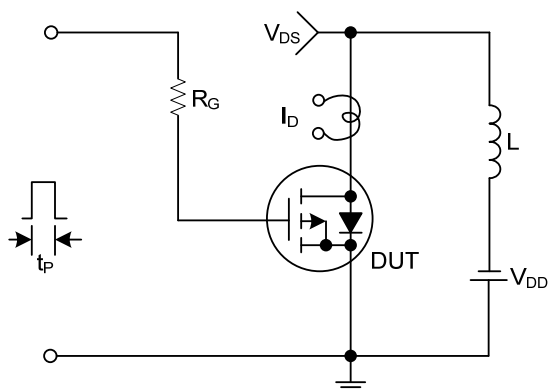
Gate Charge Waveforms



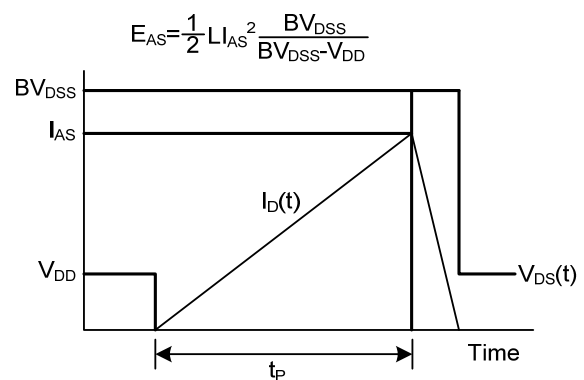
Resistive Switching Test Circuit



Resistive Switching Waveforms

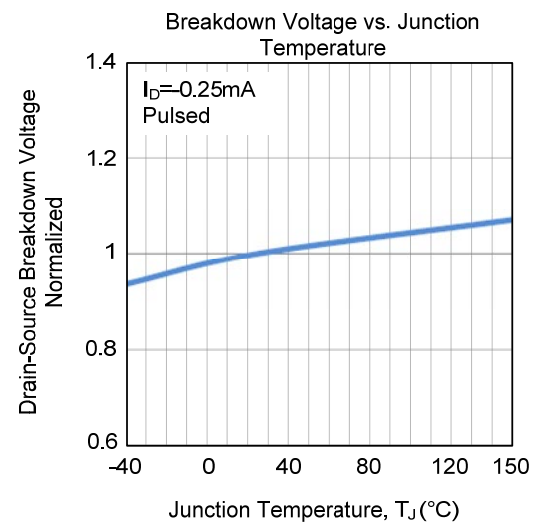
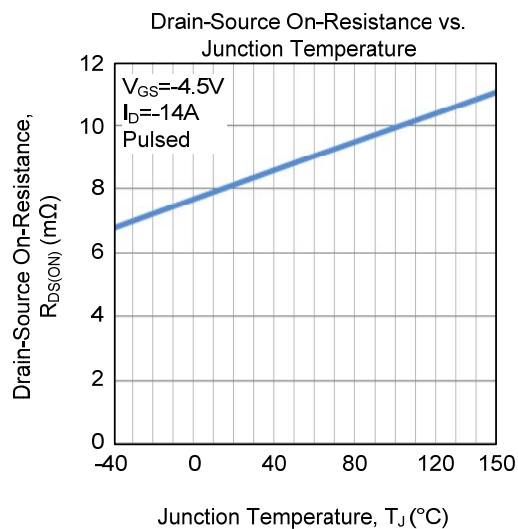
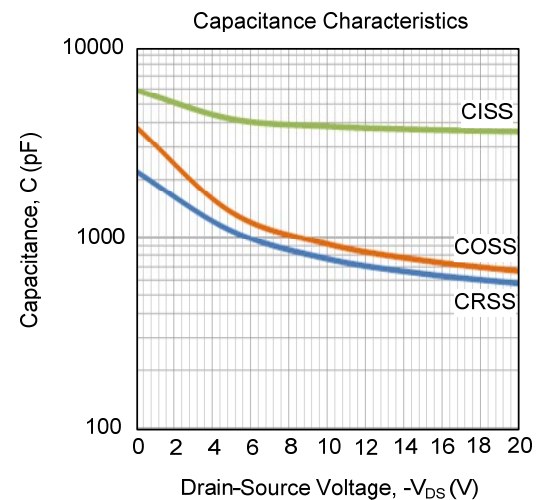
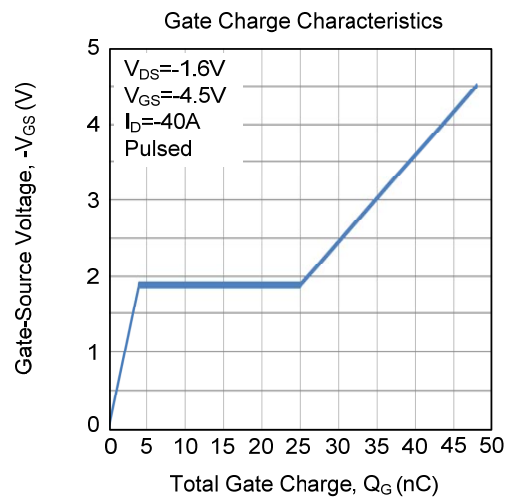
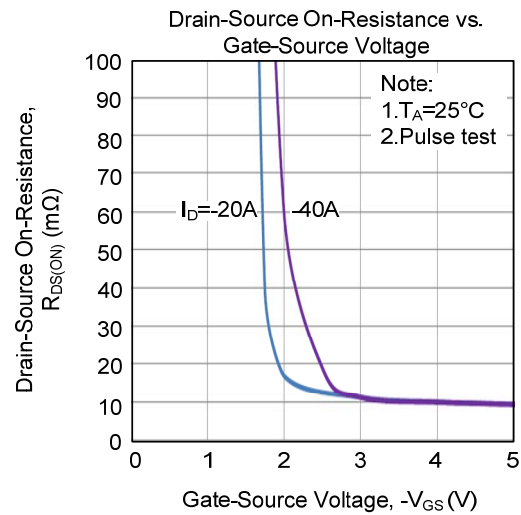
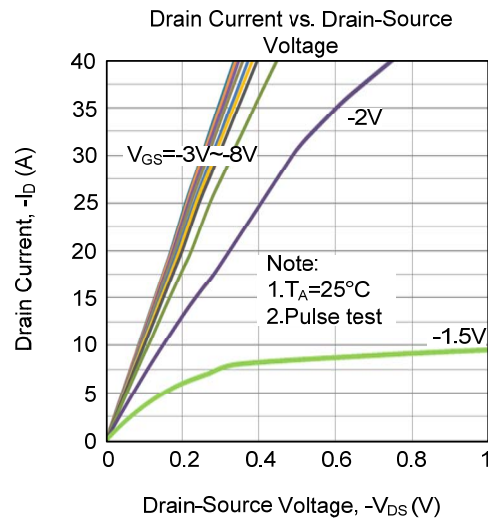


Unclamped Inductive Switching Test Circuit

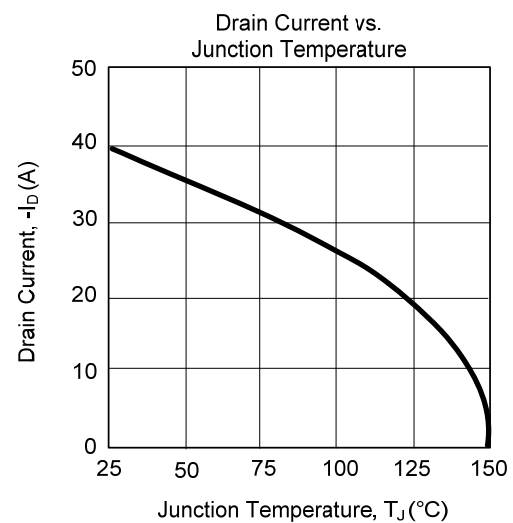
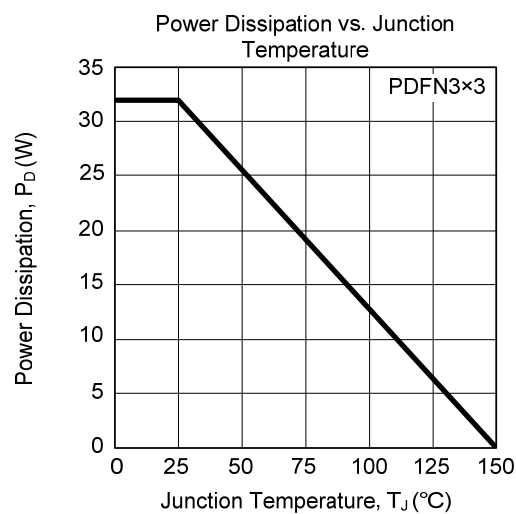
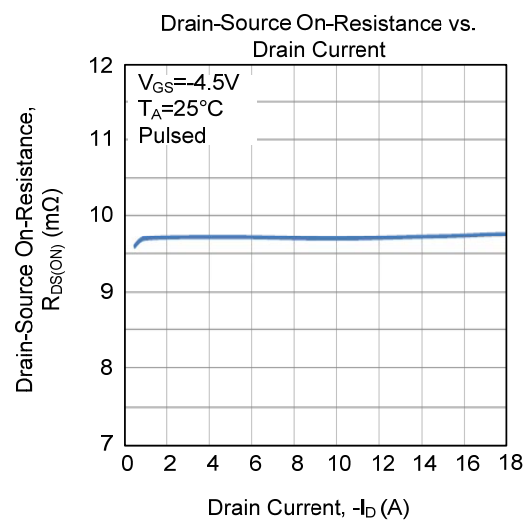
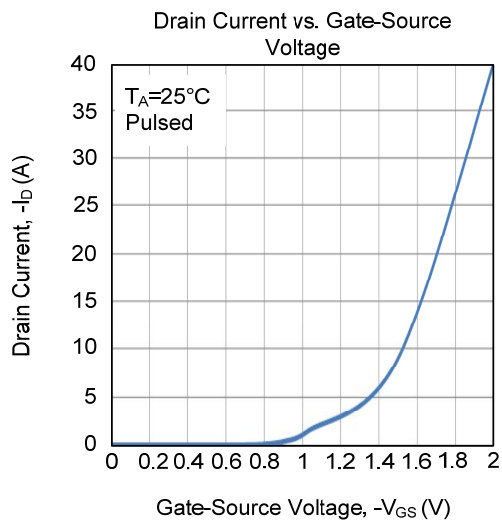
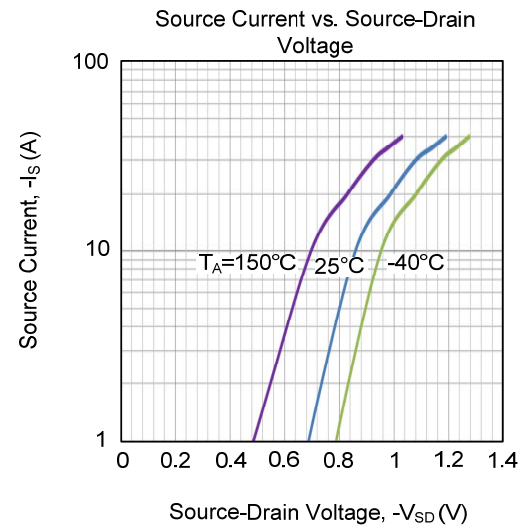
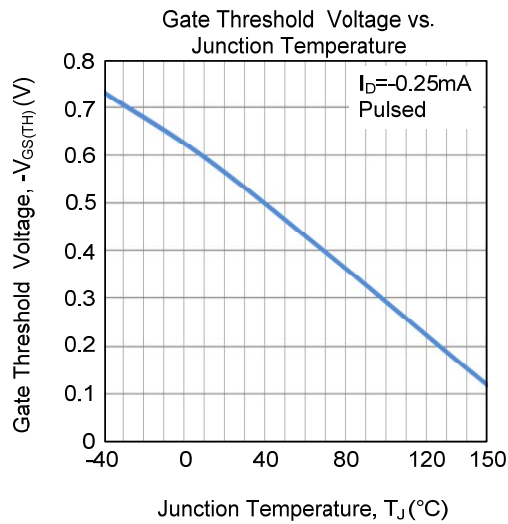


Unclamped Inductive Switching Waveforms

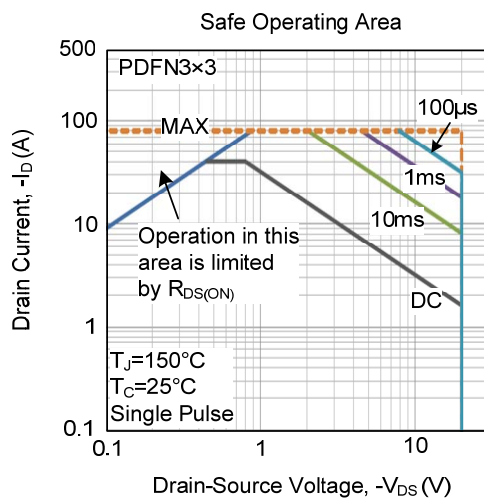
■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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