



15N10

Power MOSFET

14.7A, 100V (D-S) N-CHANNEL POWER MOSFET

DESCRIPTION

The UTC **15N10** is an N-Channel enhancement MOSFET, it uses UTC's advanced technology to provide customers with a minimum on-state resistance, high switching speed and low gate charge.

The UTC **15N10** is suitable for high efficiency switching DC/DC converter, LCD display inverter and load switch.

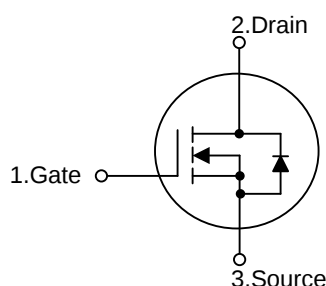
FEATURES

* $R_{DS(ON)} \leq 100 \text{ m}\Omega$ @ $V_{GS}=10\text{V}$, $I_D=8.0\text{A}$

$R_{DS(ON)} \leq 110 \text{ m}\Omega$ @ $V_{GS}=4.5\text{V}$, $I_D=8.0\text{A}$

* High switching speed

SYMBOL



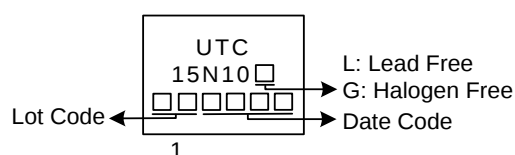
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
15N10L-TA3-T	15N10G-TA3-T	TO-220	G	D	S	Tube
15N10L-TM3-T	15N10G-TM3-T	TO-251	G	D	S	Tube
15N10L-TN3-R	15N10G-TN3-R	TO-252	G	D	S	Tape Reel

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

15N10G-TA3-T (1) Packing Type (2) Package Type (3) Green Package	(1) T: Tube, R: Tape Reel (2) TA3: TO-220, TM3: TO-251, TN3: TO-252 (3) G: Halogen Free and Lead Free, L: Lead Free
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MARKING



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

PARAMETER			SYMBOL	RATINGS	UNIT
Drain-Source Voltage			V _{DSS}	100	V
Gate-Source Voltage			V _{GSS}	±20	V
Drain Current	Continuous	T _C =25°C	I _D	14.7	A
		T _C =70°C		13.6	A
	Pulsed		I _{DM}	30	A
Power Dissipation	T _C =25°C	TO-220	P _D	60	W
		TO-251		34.7	W
		TO-252			
Operating Junction Temperature			T _J	-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 DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220	θ _{JA}	62.5	°C/W
	TO-251/TO-252		110	°C/W
Junction to Case (Note)	TO-220	θ _{JC}	2.5	°C/W
	TO-251/TO-252		3.6 (Note)	°C/W

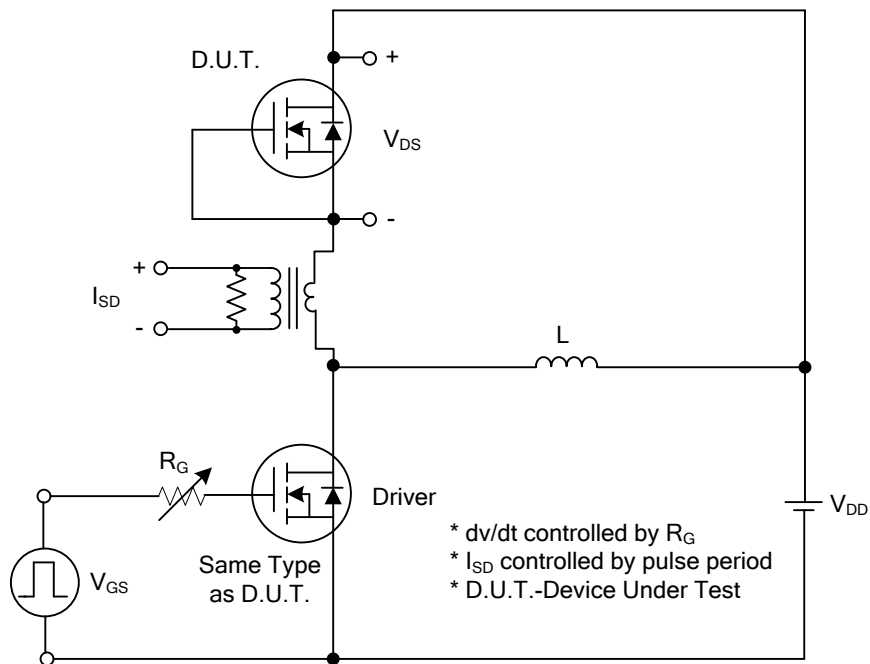
Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

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

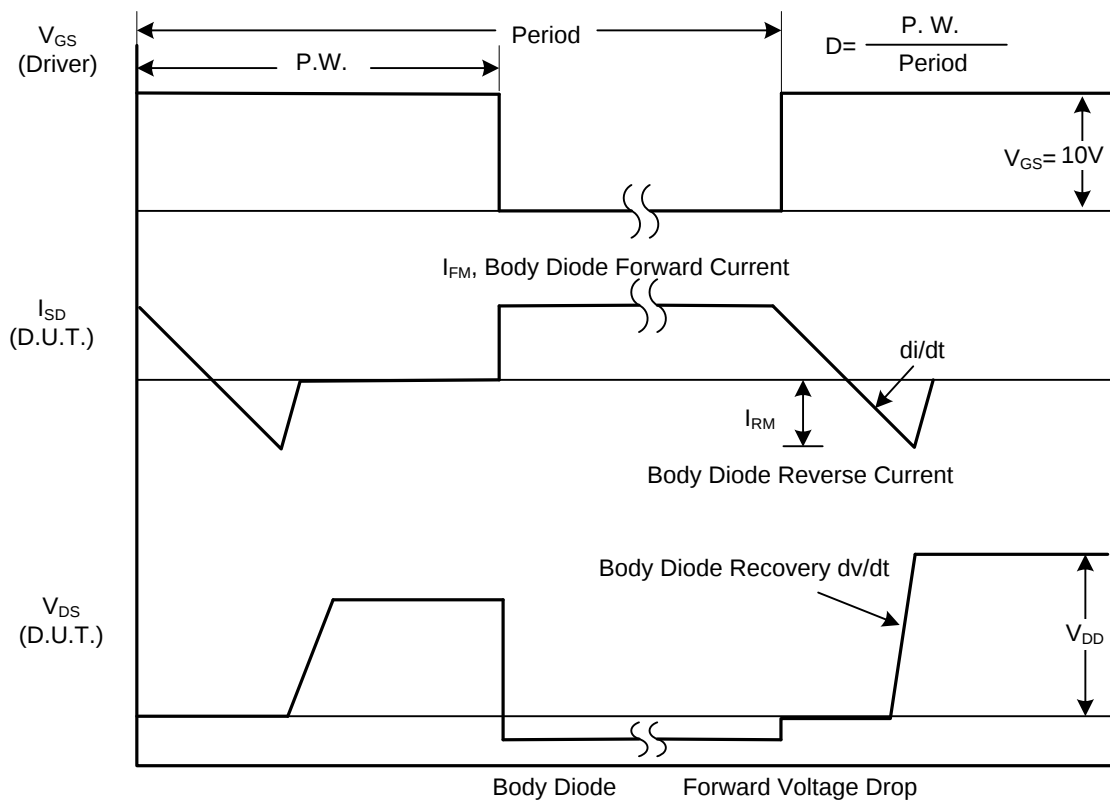
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D =250μA, V _{GS} =0V	100			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =80V, V _{GS} =0V			1	μA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =+20V, V _{DS} =0V			+100	nA
		V _{GS} =-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
Drain-Source On-State Resistance (Note)	R _{DS(ON)}	V _{GS} =10V, I _D =8.0A			100	mΩ
		V _{GS} =4.5V, I _D =8.0A			110	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	V _{GS} =0V, V _{DS} =15V, f=1MHz		1411		pF
Output Capacitance	C _{OSS}			78		pF
Reverse Transfer Capacitance	C _{RSS}			65		pF
Gate-Resistance	R _G	V _{DS} =0V, V _{GS} =0V, f=1MHz		0.81		Ω
SWITCHING PARAMETERS						
Total Gate Charge	Q _G	V _{GS} =10V, V _{DS} =80V, I _D =15A		34		nC
Total Gate Charge	Q _G	V _{GS} =4.5V, V _{DS} =80V, I _D =15A		18.4		nC
Gate to Source Charge	Q _{GS}			5.5		nC
Gate to Drain Charge	Q _{GD}			8		nC
Turn-ON Delay Time	t _{D(ON)}	V _{DS} =50V, V _{GS} =10V, I _D =15A, R _G =25Ω		13		ns
Rise Time	t _R			22		ns
Turn-OFF Delay Time	t _{D(OFF)}			100		ns
Fall-Time	t _F			43		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage	V _{SD}	I _S =8A, V _{GS} =0V		0.9	1.2	V

Note: Pulse test: pulse width ≤ 300us, duty cycle ≤ 2%, Guaranteed by design, not subject to production testing.

■ TEST CIRCUITS AND WAVEFORMS

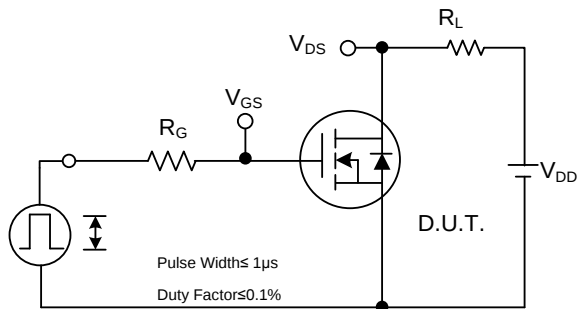


Peak Diode Recovery dv/dt Test Circuit

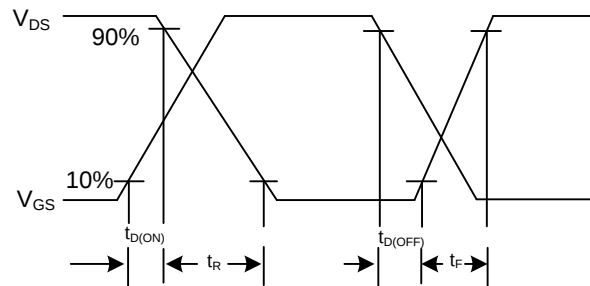


Peak Diode Recovery dv/dt Waveforms

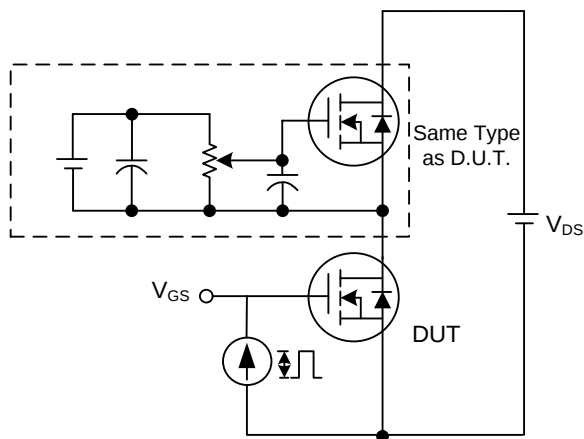
■ TEST CIRCUITS AND WAVEFORMS



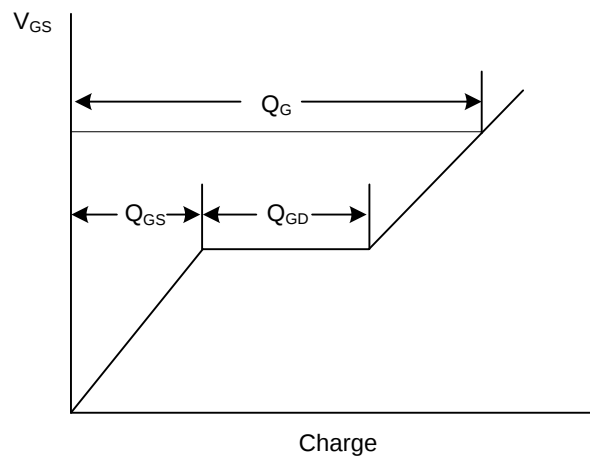
Switching Test Circuit



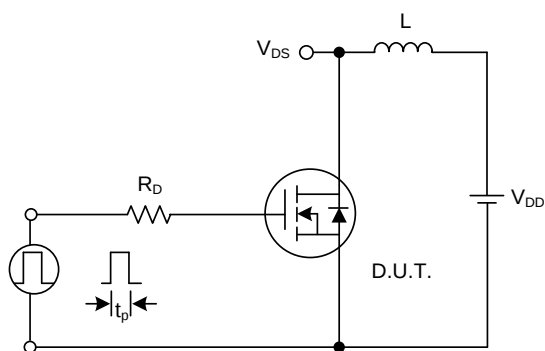
Switching Waveforms



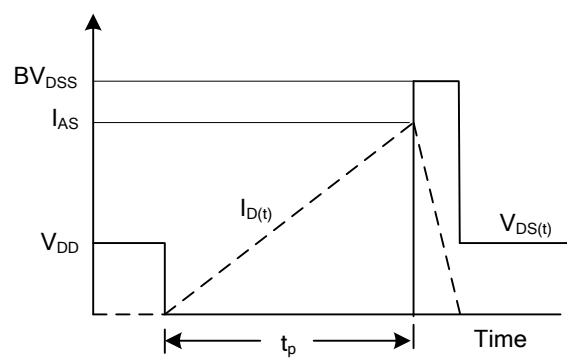
Gate Charge Test Circuit



Gate Charge Waveform

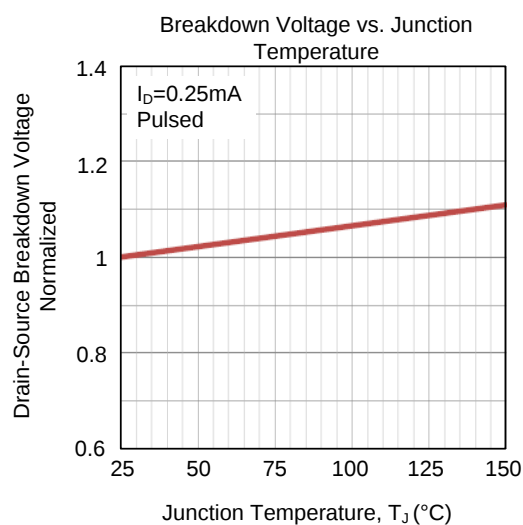
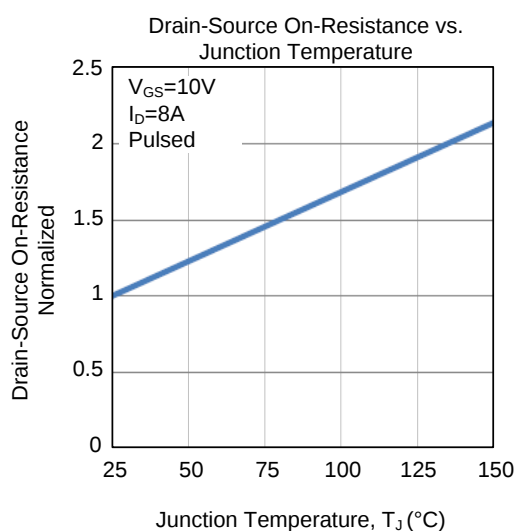
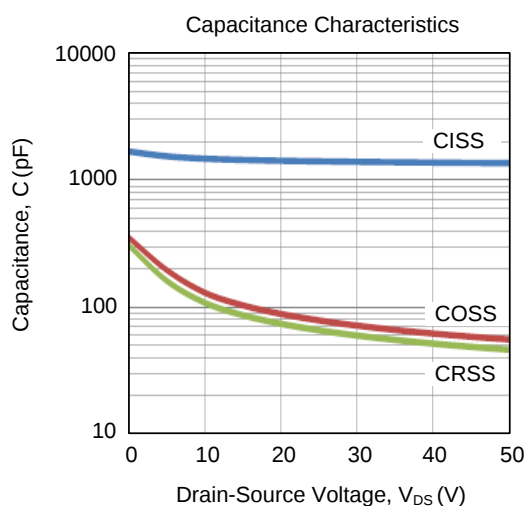
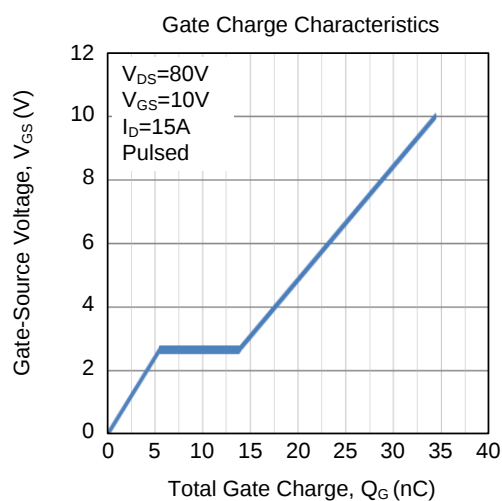
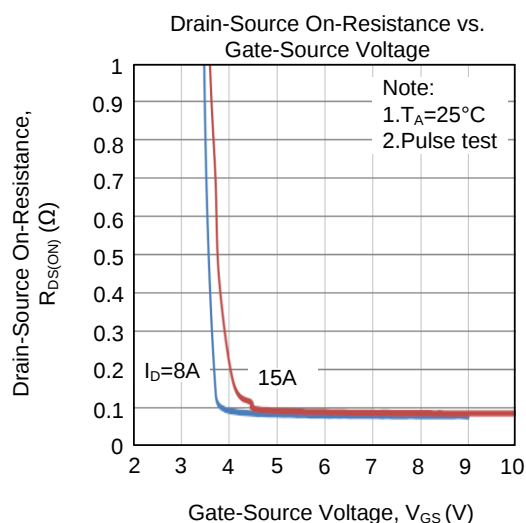
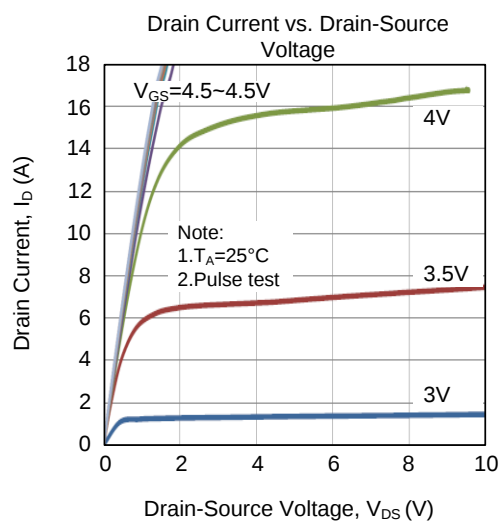


Unclamped Inductive Switching Test Circuit

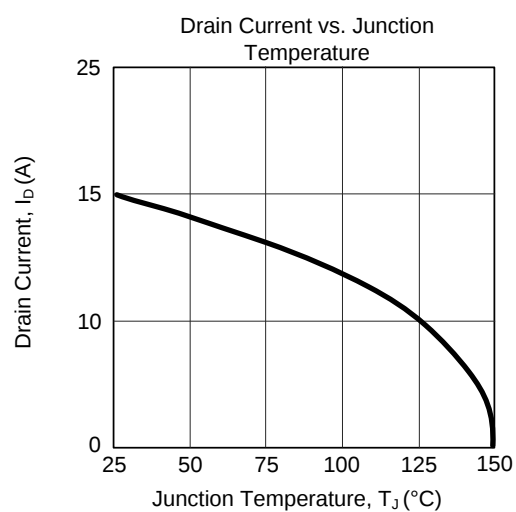
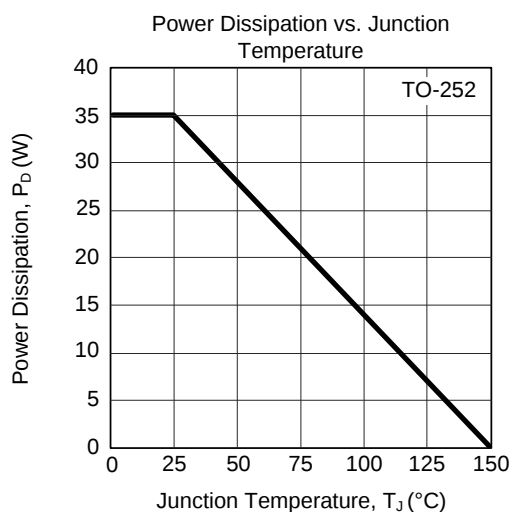
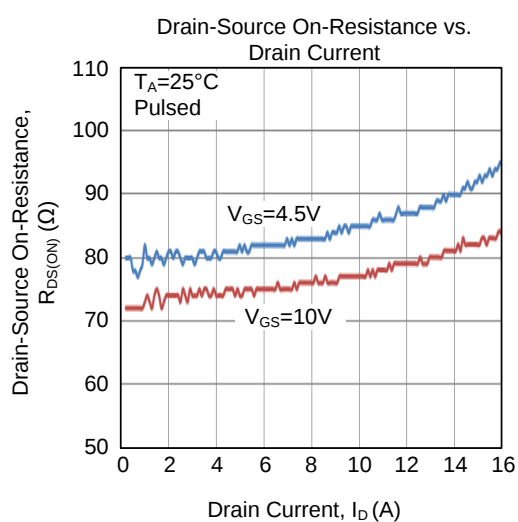
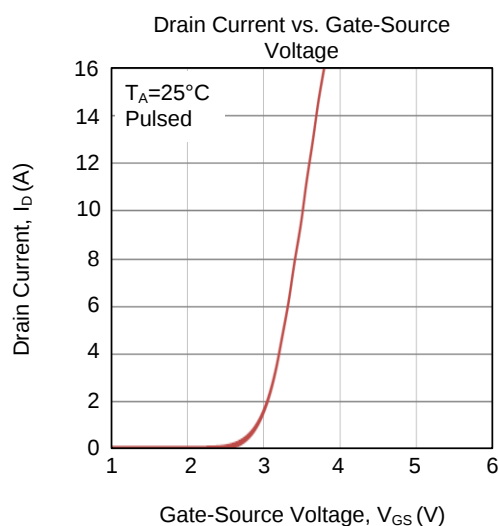
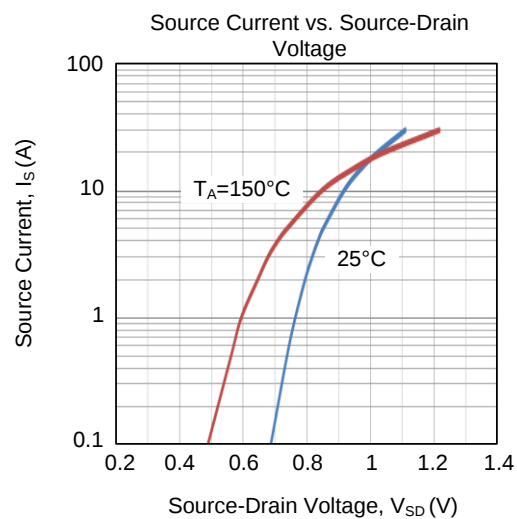
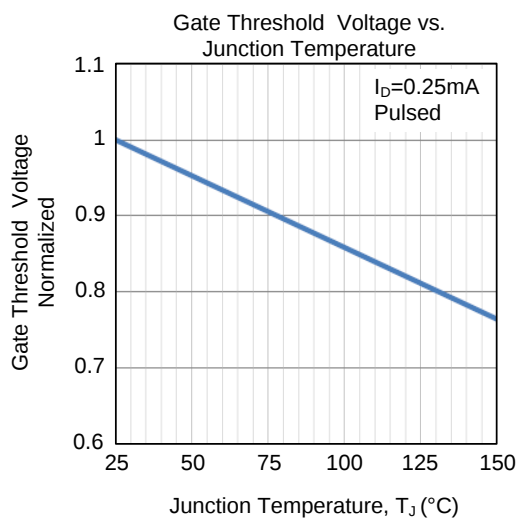


Unclamped Inductive Switching Waveforms

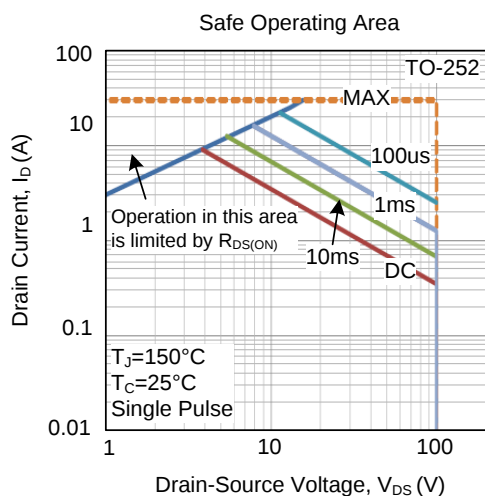
■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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