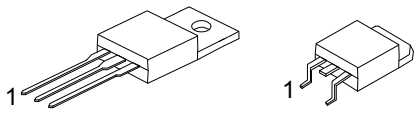
UT30N15H

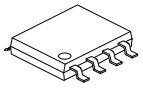
Power MOSFET

30A, 150V N-CHANNEL POWER MOSFET

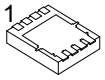


TO-220

TO-252



SOP-8



PDFN5×6

■ DESCRIPTION

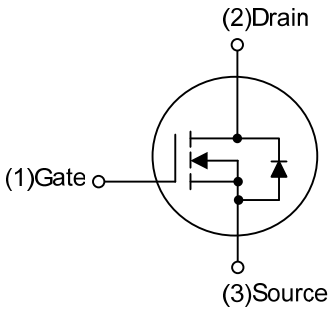
The UTC **UT30N15H** is a N-channel mode power MOSFET using UTC's advanced technology to provide customers with a minimum on-state resistance, low gate charge and high switching speed.

The UTC **UT30N15H** is suitable for high voltage synchronous rectifier and AC/DC converters, etc.

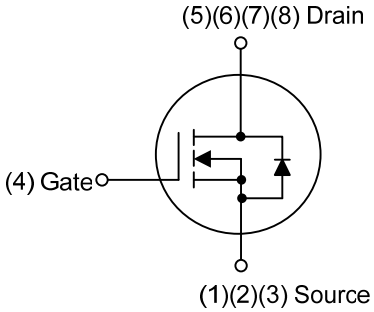
■ FEATURES

* $R_{DS(ON)} \leq 42\ m\Omega$ @ V_{GS}=10V, I_D=15A
* High Switching Speed

■ SYMBOL



TO-220/TO-252

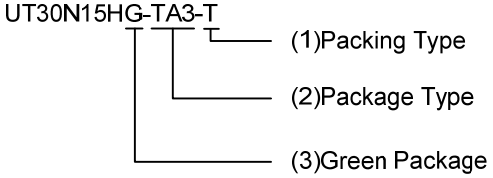


SOP-8/PDFN5×6

■ ORDERING INFORMATION

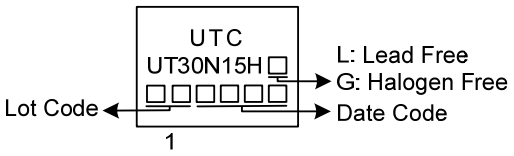
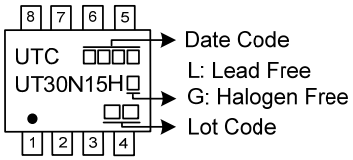
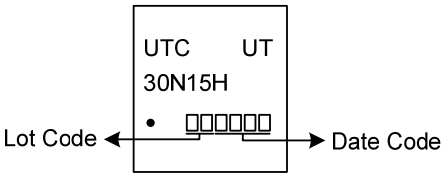
Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT30N15HL-TA3-T	UT30N15HG-TA3-T	TO-220	G	D	S	-	-	-	-	-	Tube
UT30N15HL-TN3-R	UT30N15HG-TN3-R	TO-252	G	D	S	-	-	-	-	-	Tape Reel
UT30N15HL-S08-R	UT30N15HG-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel
UT30N15HL-P5060-R	UT30N15HG-P5060-R	PDFN5×6	S	S	S	G	D	D	D	D	Tape Reel

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



(1) T: Tube, R: Tape Reel
(2) TA3: TO-220, TN3: TO-252, S08: SOP-8
P5060: PDFN5×6
(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING

PACKAGE	MARKING
TO-220 TO-252	
SOP-8	
PDFN5×6	

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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	150	V
Gate-Source Voltage		V_{GSS}	±20	V
Drain Current	Continuous (V_{GS}=10V) T_C=25°C	I_D	30	A
	Pulsed	I_{DM}	90	A
Avalanche Energy (Note 3)	Single Pulsed	E_{AS}	120	mJ
Peak Diode Recovery dv/dt (Note 3)		dv/dt	3.5	V/ns
Power Dissipation	TO-220	P_D	120	W
	TO-252		48	W
	SOP-8		6	W
	PDFN5×6		18	W
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.
3. L=0.1mH, I_{AS}=49A, V_{DD}= 50V, R_G=25Ω, Starting T_J=25°C.
4. I_{SD} ≤ 30A, di/dt ≤ 200A/μs, V_{DD} ≤ BV_{DSS}, Starting T_J=25°C.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220	θ_{JA}	62.5	°C/W
	TO-252		110	°C/W
	SOP-8		90	°C/W
	PDFN5×6		83	°C/W
Junction to Case	TO-220	θ_{JC}	1.04	°C/W
	TO-252		2.6 (Note)	°C/W
	SOP-8		20.8 (Note)	°C/W
	PDFN5×6		6.9 (Note)	°C/W

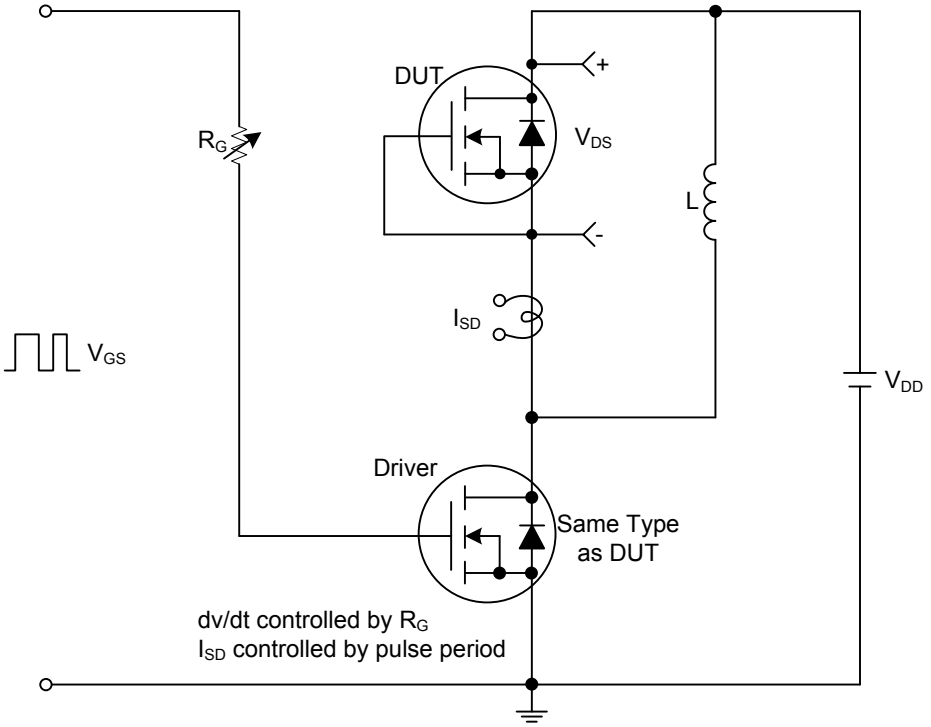
Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

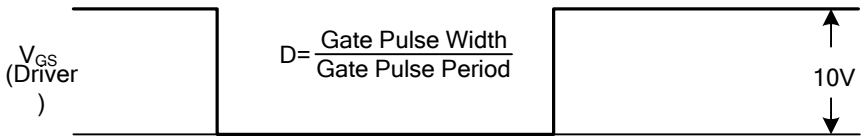
■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified)

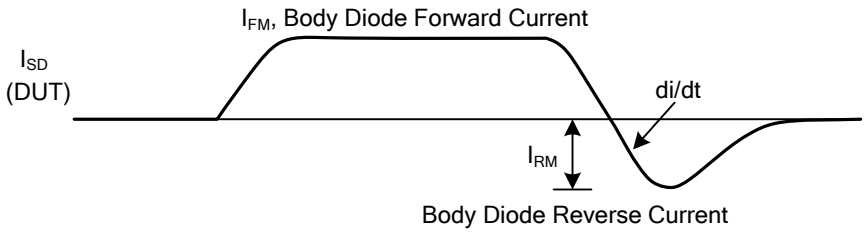
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	I_D=250μA, V_{GS}=0V	150			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=150V, V_{GS}=0V			10	μA
Gate- Source Leakage Current	Forward	I_{GSS}	V_{GS}=+20V, V_{DS}=0V			+100	nA
	Reverse		V_{GS}=-20V, V_{DS}=0V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250μA	2.0		4.0	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	V_{GS}=10V, I_D=15A			42	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	V_{GS}=0V, V_{DS}=25V, f=1.0MHz		3600		pF
Output Capacitance		C_{OSS}			240		pF
Reverse Transfer Capacitance		C_{RSS}			200		pF
SWITCHING PARAMETERS							
Total Gate Charge at 10V		Q_G	V_{DS}=120V, V_{GS}=10V, I_D=30A (Note 1, 2)		138		nC
Gate to Source Charge		Q_{GS}			20		nC
Gate to Drain Charge		Q_{GD}			55		nC
Turn-ON Time		$t_{D(ON)}$	V_{DD} =75V, V_{GS}=10V, I_D=30A, R_G=3Ω (Note 1, 2)		20		ns
Turn-ON Delay Time		t_R			24		ns
Rise Time		$t_{D(OFF)}$			77		ns
Turn-OFF Delay Time		t_F			32		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I_S				30	A
Continuous Drain-Source Current		I_{SD}				90	A
Drain-Source Diode Forward Voltage		V_{SD}	I_S=30A, V_{GS}=0V			1.4	V
Reverse Recovery Time (Note)		t_{rr}	I_S=30A, V_{GS}=0V, di/dt=100A/μs		100		ns
Reverse Recovery Charge		Q_{rr}			300		nC

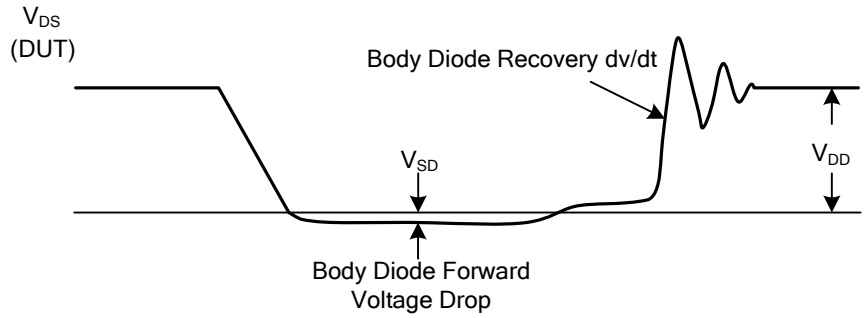
Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.
2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS



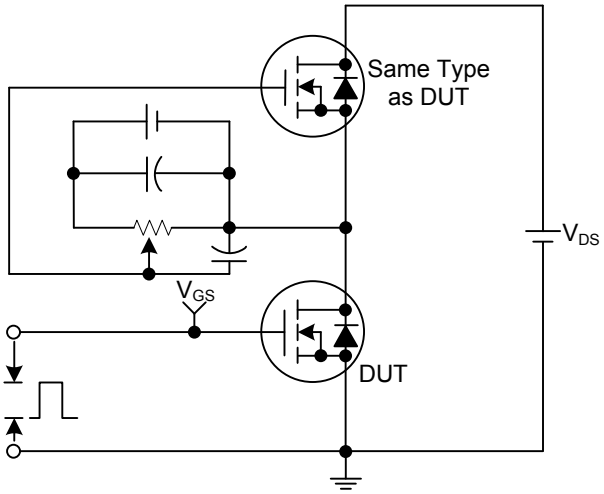




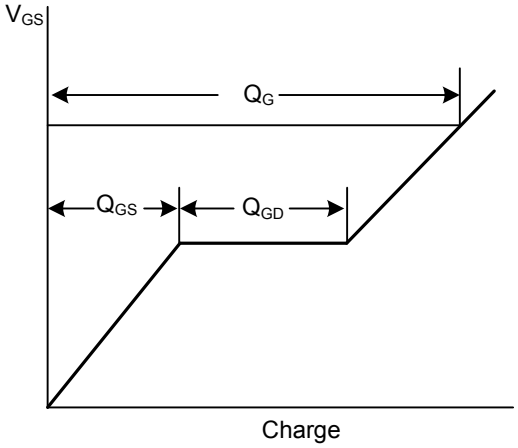


Peak Diode Recovery dv/dt Test Circuit and Waveforms

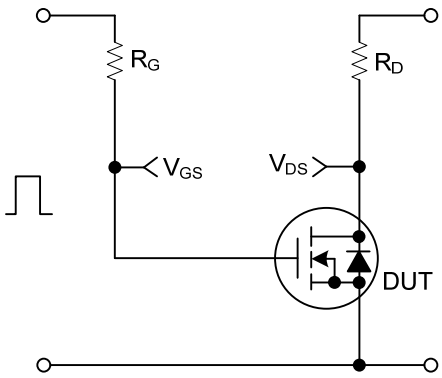
■ TEST CIRCUITS AND WAVEFORMS



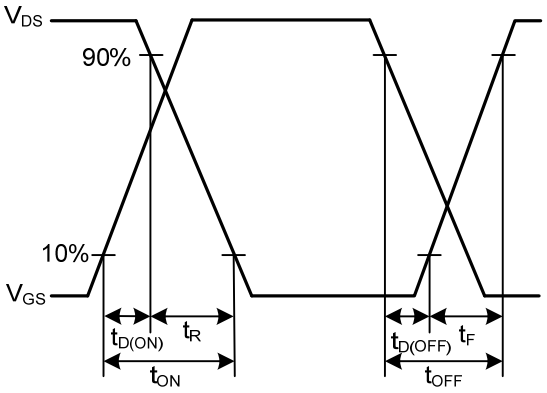
Gate Charge Test Circuit



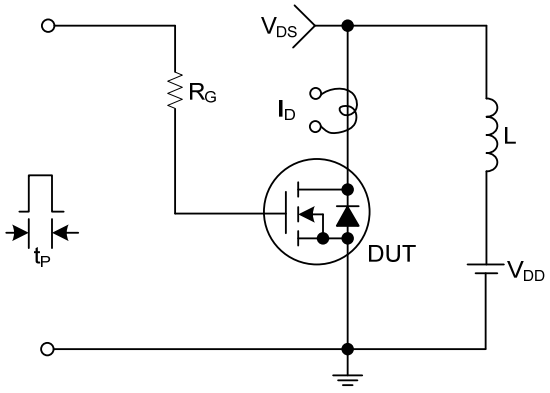
Gate Charge Waveforms



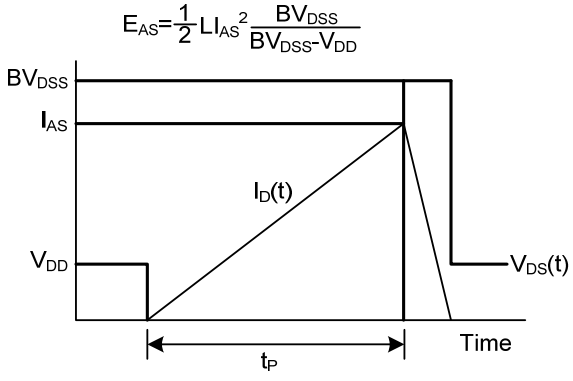
Resistive Switching Test Circuit



Resistive Switching Waveforms

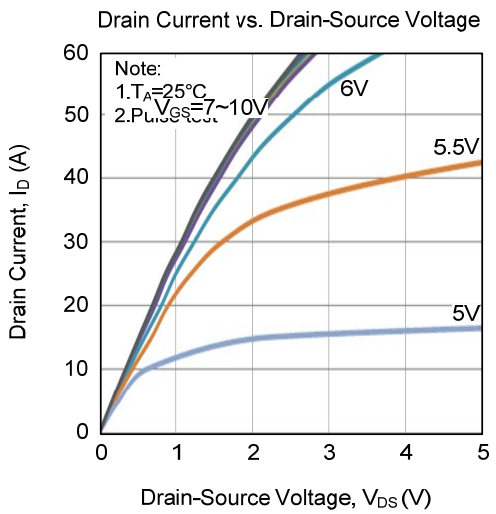


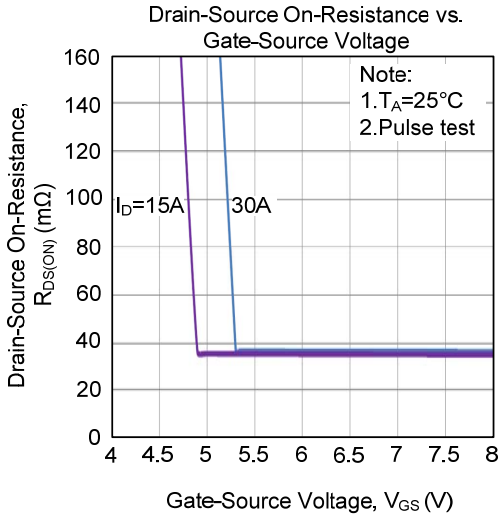
Unclamped Inductive Switching Test Circuit

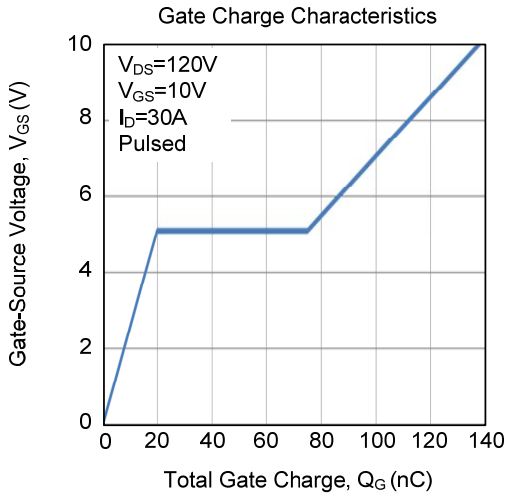


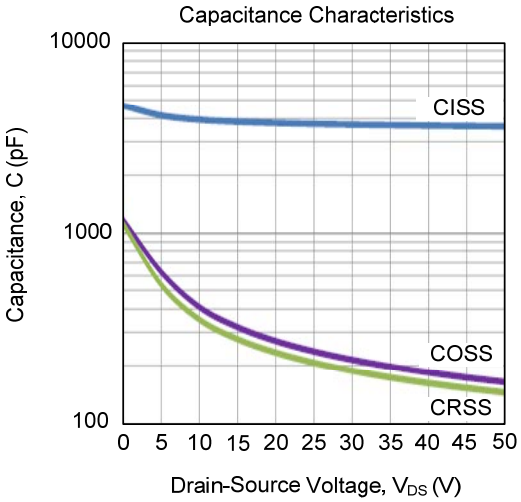
Unclamped Inductive Switching Waveforms

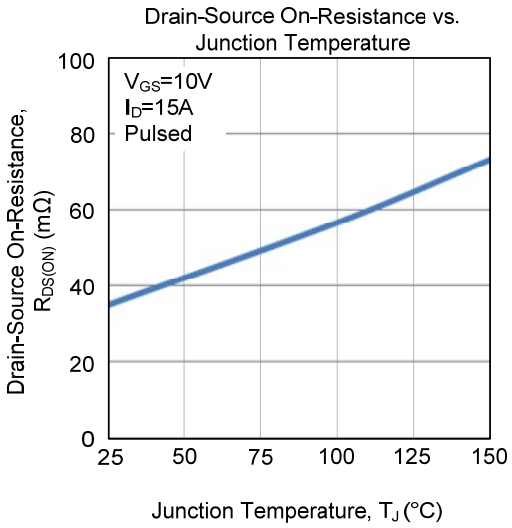
■ TYPICAL CHARACTERISTICS

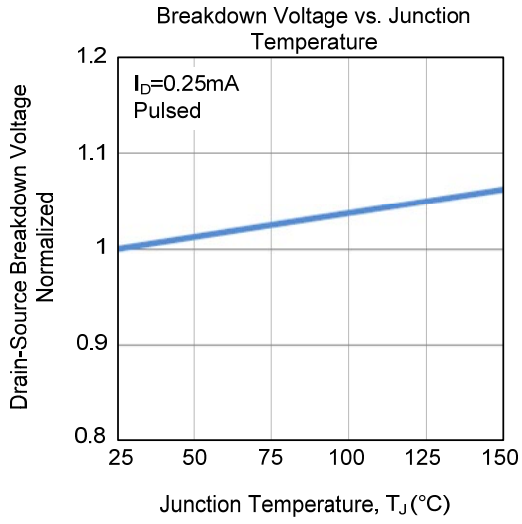






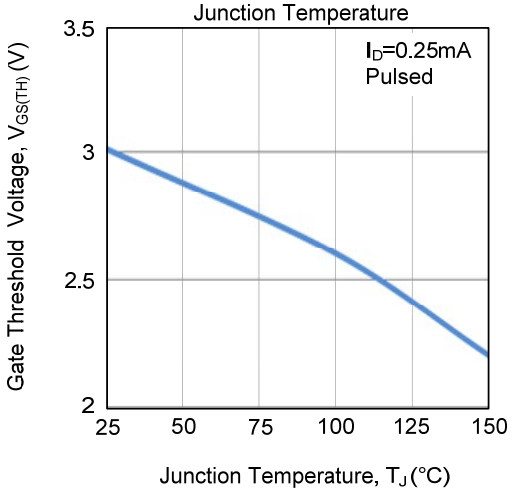




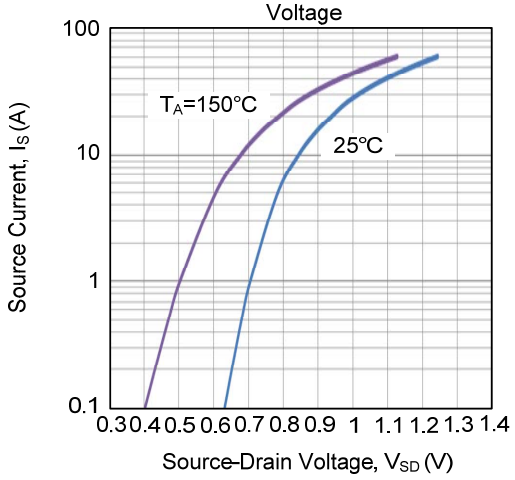


■ TYPICAL CHARACTERISTICS (Cont.)

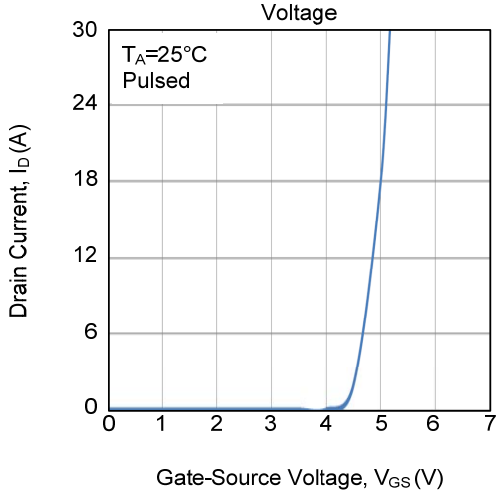
Gate Threshold Voltage vs. Junction Temperature



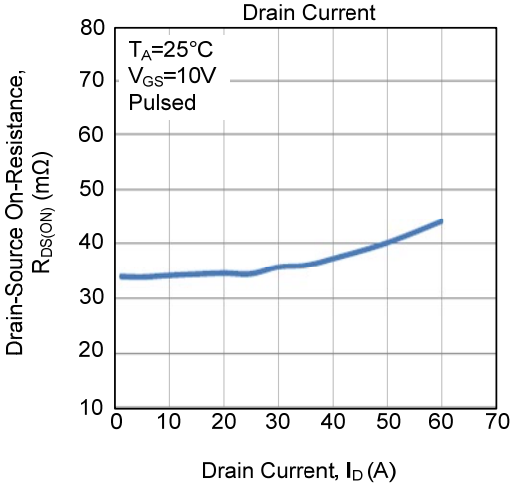
Source Current vs. Source-Drain Voltage



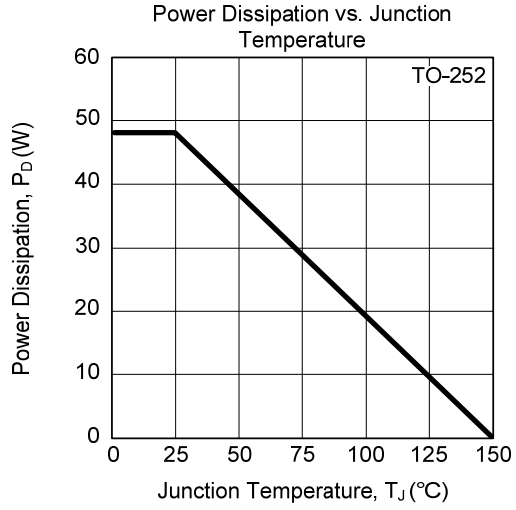
Drain Current vs. Gate-Source Voltage



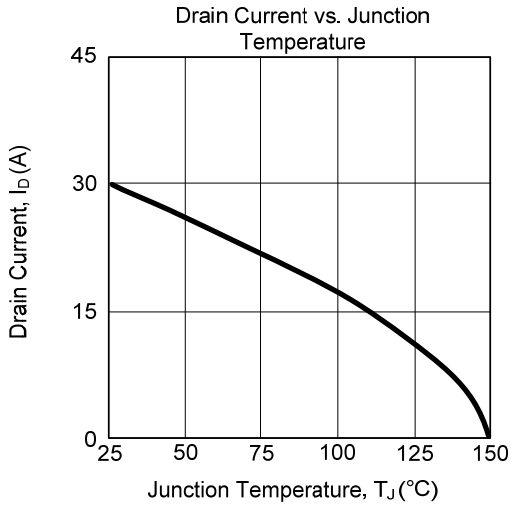
Drain-Source On-Resistance vs. Drain Current



Power Dissipation vs. Junction Temperature



Drain Current vs. Junction Temperature



■ TYPICAL CHARACTERISTICS (Cont.)