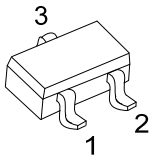
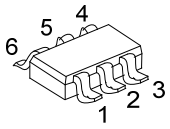
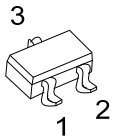
750mA, 20V N-CHANNEL POWER MOSFET



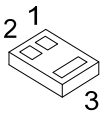
SOT-23-3
(JEDEC TO-236)



SOT-363



SOT-523



DFN1006-3

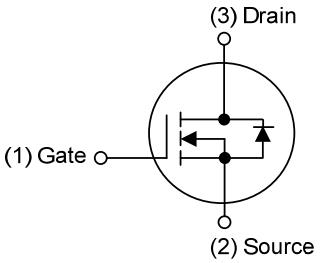
■ DESCRIPTION

The UTC **UT3434** is N-channel enhancement mode power MOSFET using UTC's advanced technology to provide the customers with perfect $R_{DS(ON)}$ and low gate charge. This device can be operated with 4.5V low gate voltage.

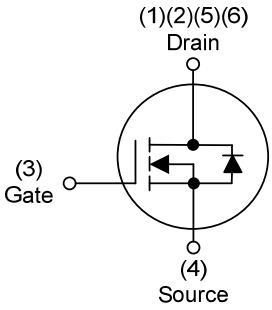
■ FEATURES

* $R_{DS(ON)}$ ≤ 300 mΩ @ V_{GS}=4.5V, I_D=600mA
  $R_{DS(ON)}$ ≤ 450 mΩ@ V_{GS}=2.5V, I_D=200mA
  $R_{DS(ON)}$ ≤ 600 mΩ@ V_{GS}=1.8V, I_D=100mA
  $R_{DS(ON)}$ ≤ 850 mΩ@ V_{GS}=1.5V, I_D=50Ma

■ SYMBOL



SOT-23-3 / SOT-523
DFN1006-3

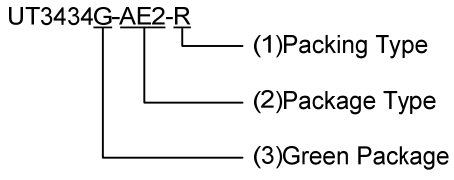


SOT-363

■ ORDERING INFORMATION

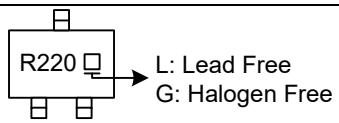
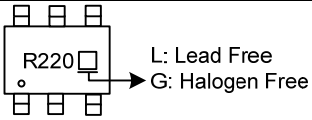
Ordering Number		Package	Pin Assignment						Packing
Lead Free	Halogen Free		1	2	3	4	5	6	
UT3434L-AE2-R	UT3434G-AE2-R	SOT-23-3	G	S	D	-	-	-	Tape Reel
UT3434L-AL6-R	UT3434G-AL6-R	SOT-363	D	D	G	S	D	D	Tape Reel
UT3434L-AN3-R	UT3434G-AN3-R	SOT-523	G	S	D	-	-	-	Tape Reel
UT3434L-K03-1006-R	UT3434G-K03-1006-R	DFN1006-3	G	S	D	-	-	-	Tape Reel

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



(1) R: Tape Reel
(2) AE2: SOT-23-3, AL6: SOT-363, AN3: SOT-523
K03-1006: DFN1006-3
(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING

PACKAGE	MARKING
SOT-23-3 SOT-523	
SOT-363	
DFN1006-3	

■ ABSOLUTE MAXIMUM RATINGS (T_A=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	Continuous (Note 1, 2)	I_D	750	mA
	Pulsed	I_{DM}	1500	mA
Power Dissipation (Note 2)	SOT-23-3	P_D	300	mW
	SOT-363		260	mW
	SOT-523		150	mW
	DFN1006-3		350	mW
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.

■ THERMAL DATA

PARAMETER		SYMBOL	RATING	UNIT
Junction to Ambient	SOT-23-3	θ_{JA}	416	°C/W
	SOT-363		480	°C/W
	SOT-523		833	°C/W
	DFN1006-3		357	°C/W

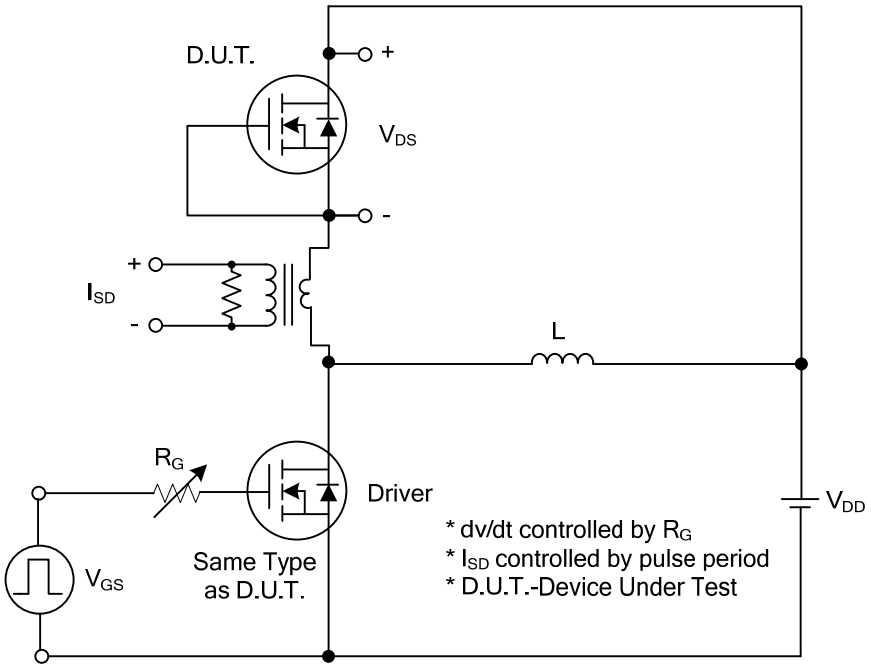
Note: Device mounted on FR-4 substrate P_C board, 2oz copper, with 1inch square copper plate.

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

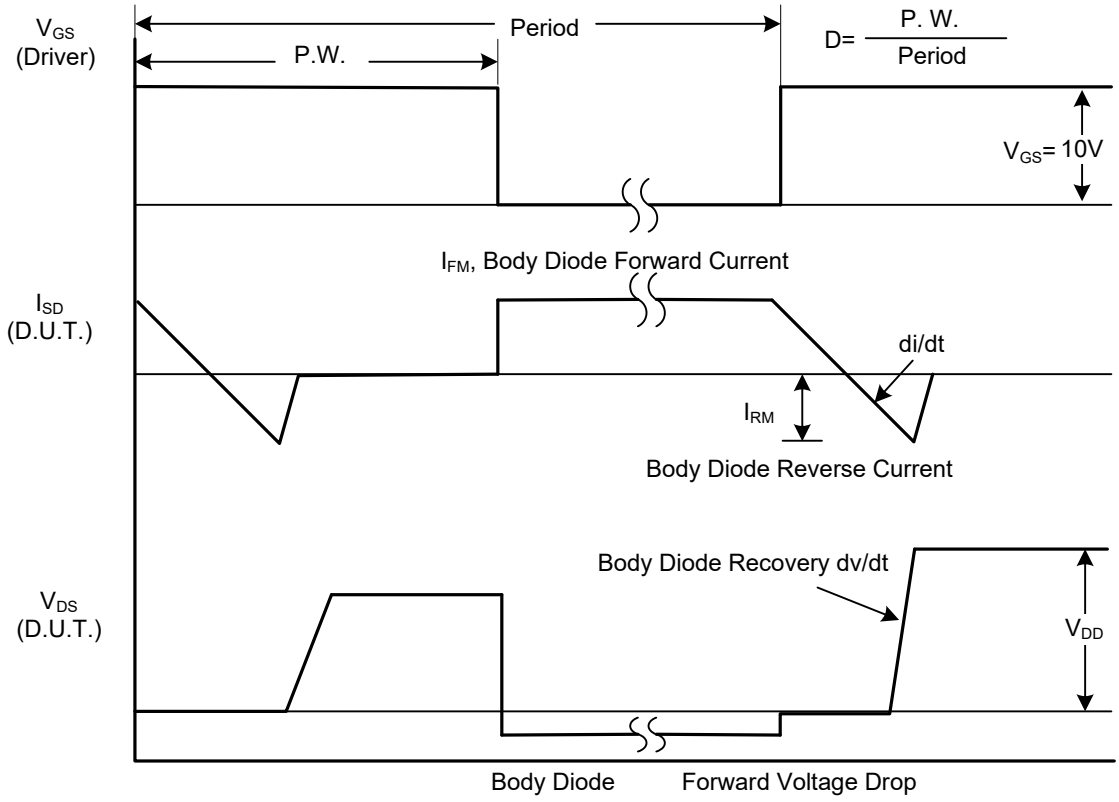
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	I_D=250μA, V_{GS}=0V	20			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=20V, V_{GS}=0V			1	μA
Gate- Source Leakage Current	Forward	I_{GSS}	V_{GS}=+8V, V_{DS}=0V			+100	nA
	Reverse		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		1.0	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	V_{GS}=4.5V, I_D=600mA			300	mΩ
			V_{GS}=2.5V, I_D=200mA			450	mΩ
			V_{GS}=1.8V, I_D=100mA			600	mΩ
			V_{GS}=1.5V, I_D=50mA			850	mΩ
SWITCHING PARAMETERS							
Input Capacitance		C_{ISS}	V_{DS}=10V, V_{GS}=0V, f=1MHz		38		pF
Output Capacitance		C_{OSS}			18		pF
Reverse Transfer Capacitance		C_{RSS}			11		pF
Total Gate Charge		Q_G	V_{DS}=10V, V_{GS}=4.5V, I_D=0.75A		3.8		nC
Gate to Source Charge		Q_{GS}			0.6		nC
Gate to Drain Charge		Q_{GD}			0.4		nC
Turn-ON Delay Time		$t_{D(ON)}$	V_{DD}=10V, V_{GS}=4.5V I_D=0.75A,, R_G=3.3Ω (Note 1, 2)		2.5		ns
Rise Time		t_R			16		ns
Turn-OFF Delay Time		$t_{D(OFF)}$			5		ns
Fall Time		t_F			60		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I_S				750	mA
Maximum Body-Diode Pulsed Current		I_{SM}				1500	mA
Drain-Source Diode Forward Voltage		V_{SD}	I_S=0.5A, V_{GS}=0V			1.3	V

Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%
2. Guaranteed by design, not subject to production testing

■ TEST CIRCUITS AND WAVEFORMS

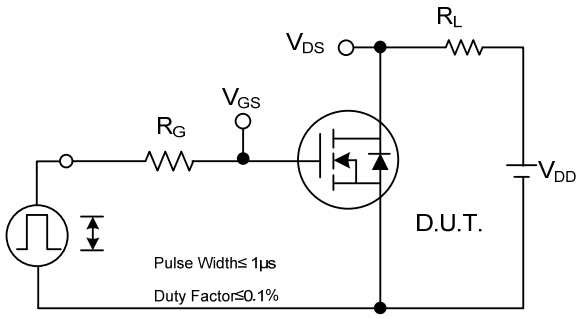


Peak Diode Recovery dv/dt Test Circuit

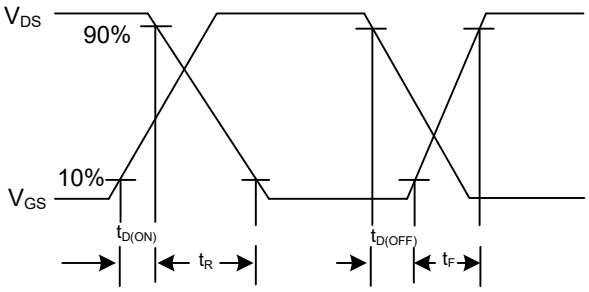


Peak Diode Recovery dv/dt Waveforms

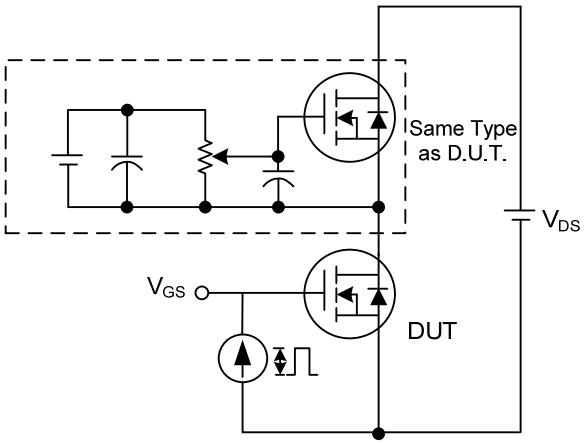
■ TEST CIRCUITS AND WAVEFORMS



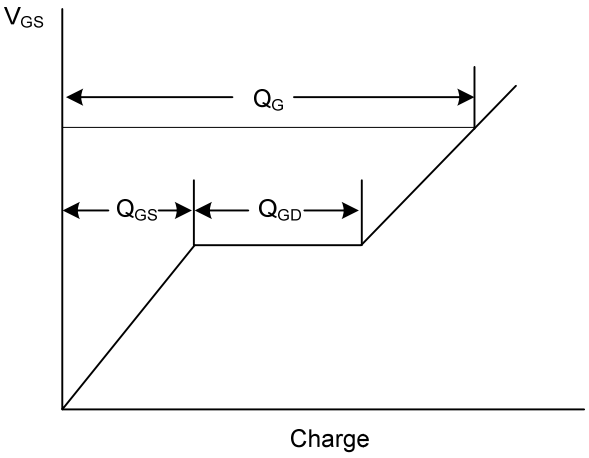
Switching Test Circuit



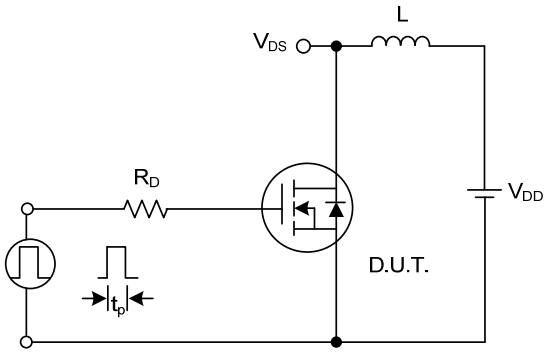
Switching Waveforms



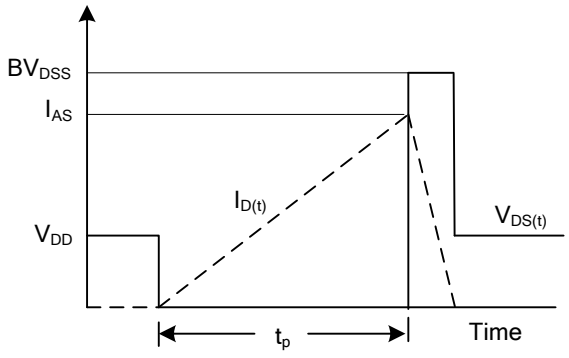
Gate Charge Test Circuit



Gate Charge Waveform

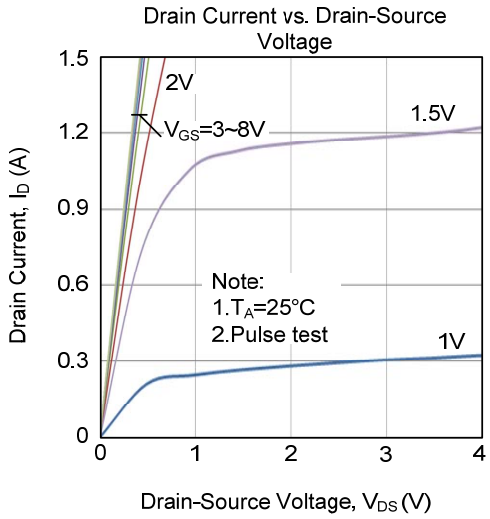


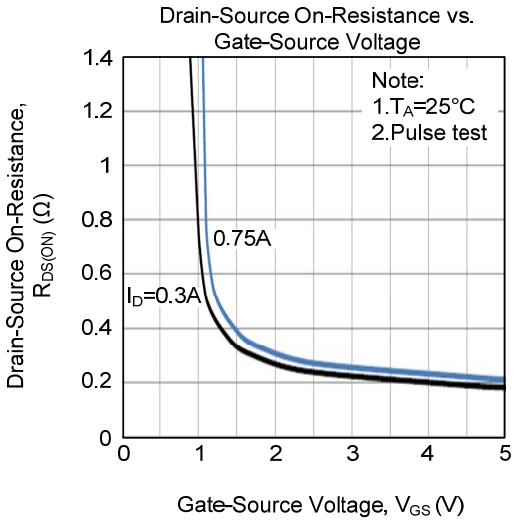
Unclamped Inductive Switching Test Circuit

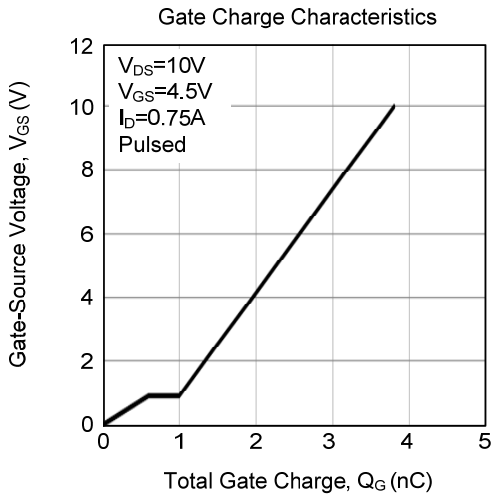


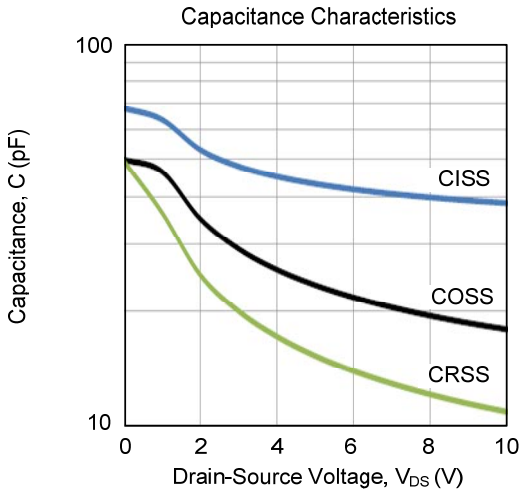
Unclamped Inductive Switching Waveforms

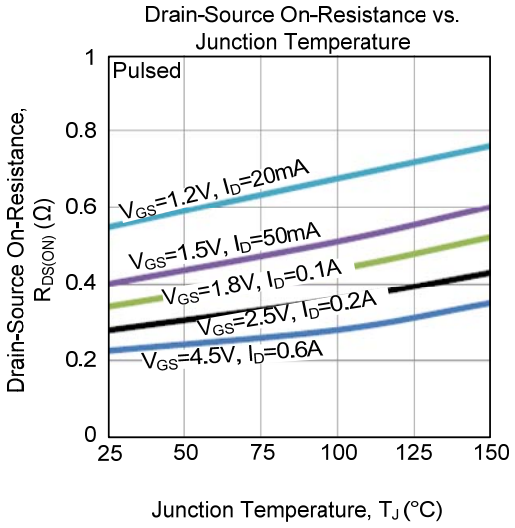
■ TYPICAL CHARACTERISTICS

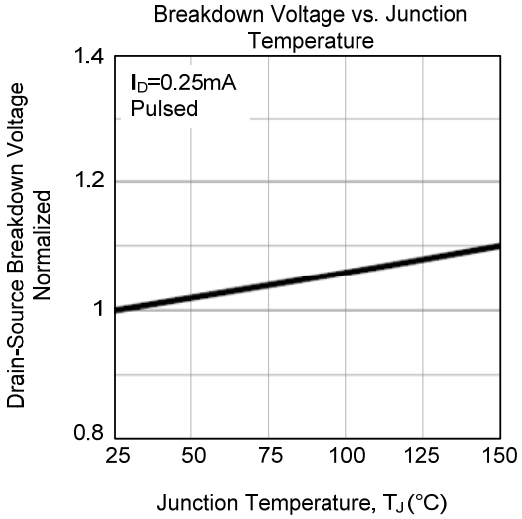






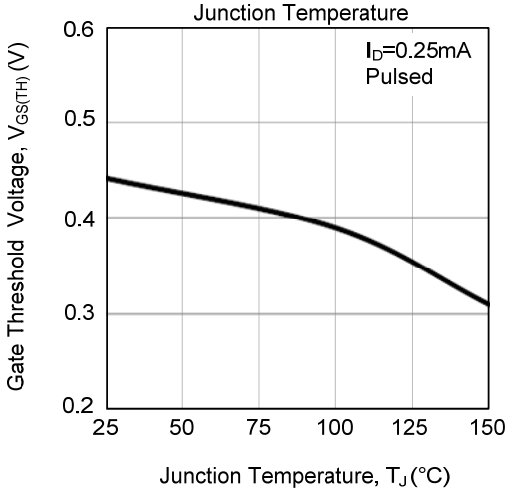




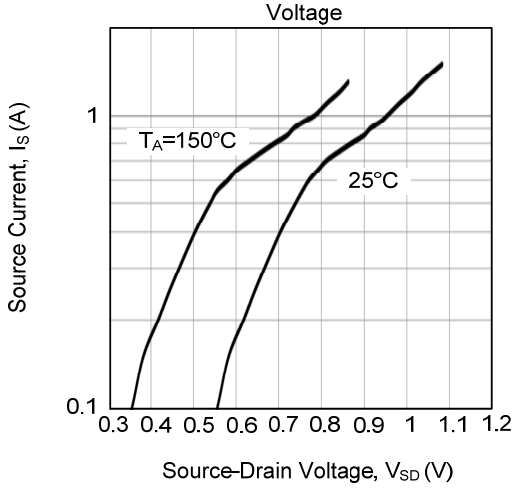


■ TYPICAL CHARACTERISTICS (Cont.)

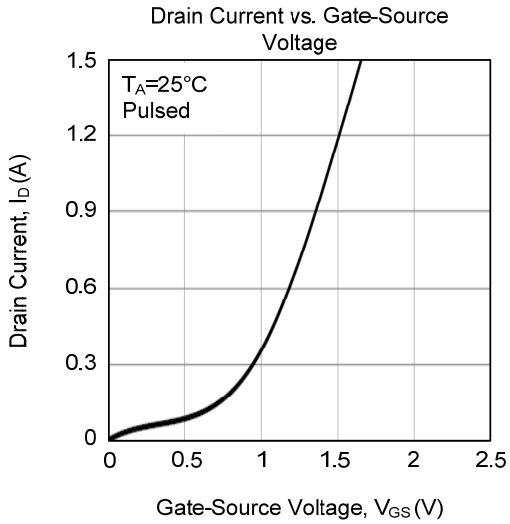
Gate Threshold Voltage vs. Junction Temperature



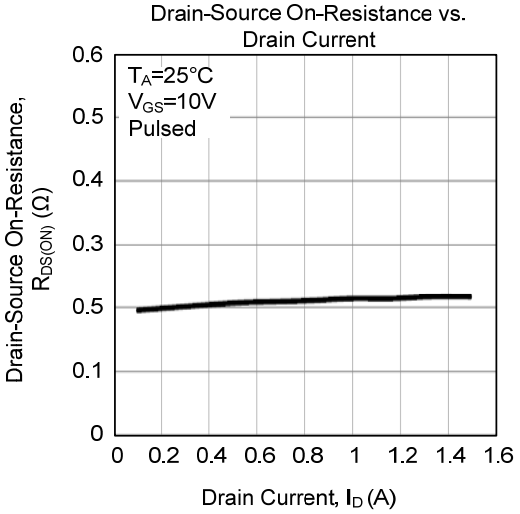
Source Current vs. Source-Drain Voltage



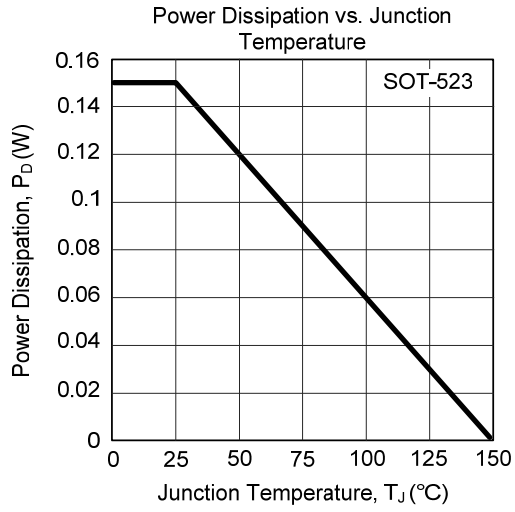
Drain Current vs. Gate-Source Voltage



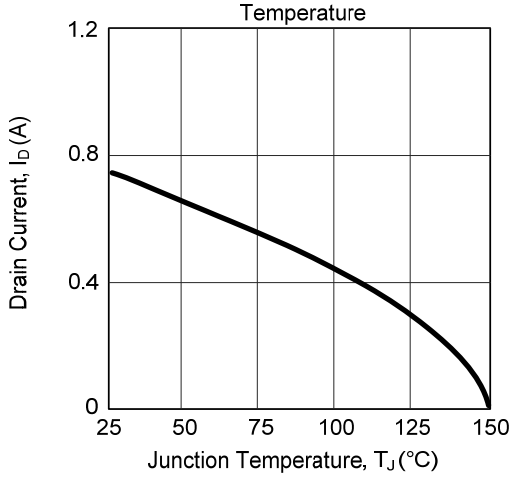
Drain-Source On-Resistance vs. Drain Current



Power Dissipation vs. Junction Temperature



Drain Current vs. Junction Temperature



■ TYPICAL CHARACTERISTICS (Cont.)