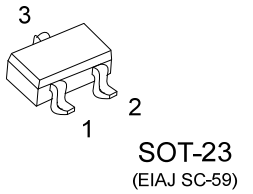
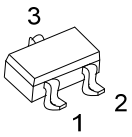
UT3419A

Power MOSFET

20V, 3.5A P-CHANNEL ENHANCEMENT MODE FIELD EFFECT TRANSISTOR



SOT-23
(EIAJ SC-59)



SOT-23-3
(JEDEC TO-236)

■ DESCRIPTION

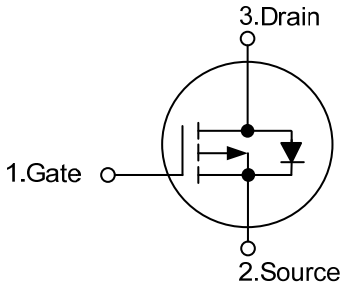
The UTC **UT3419A** is a P-channel enhancement MOSFET providing designers with excellent $R_{DS(ON)}$, low gate charge. The gate voltage is as low as 2.5V.

The UTC **UT3419A** can be applied in PWM applications or used as a load switch.

■ FEATURES

* $R_{DS(ON)} \leq 75\ m\Omega$ @ V_{GS}=-10V, I_D=-3.5A
* $R_{DS(ON)} \leq 95\ m\Omega$ @ V_{GS}=-4.5V, I_D=-3.0A
* $R_{DS(ON)} \leq 155\ m\Omega$ @ V_{GS}=-2.5V, I_D=-1.0A

■ SYMBOL



■ ORDERING INFORMATION

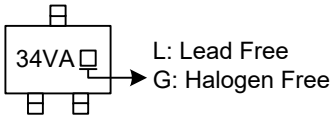
Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UT3419AL-AE2-R	UT3419AG-AE2-R	SOT-23-3	G	S	D	Tape Reel
UT3419AL-AE3-R	UT3419AG-AE3-R	SOT-23	G	S	D	Tape Reel

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

UT3419AG-AE2-R

(1)Packing Type	(1) R: Tape Reel
(2)Package Type	(2) AE2: SOT-23-3, AE3: SOT-23
(3)Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain to Source Voltage		V_{DSS}	-20	V
Gate to Source Voltage		V_{GSS}	±12	V
Continuous Drain Current (Note 1)	T_A =25°C	I_D	-3.5	A
	T_A =70°C		-2.8	A
Pulsed Drain Current (Note 2)		I_{DM}	-15	A
Total Power Dissipation (Note 1)	T_A =25°C	P_D	0.6	W
	T_A =70°C		0.4	W
Junction Temperature		T_J	-55 ~ +150	°C
Storage Temperature		T_{STG}	-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 (Note 1)	t ≤ 10s	θ_{JA}	208	°C/W
	Steady-State		290	°C/W

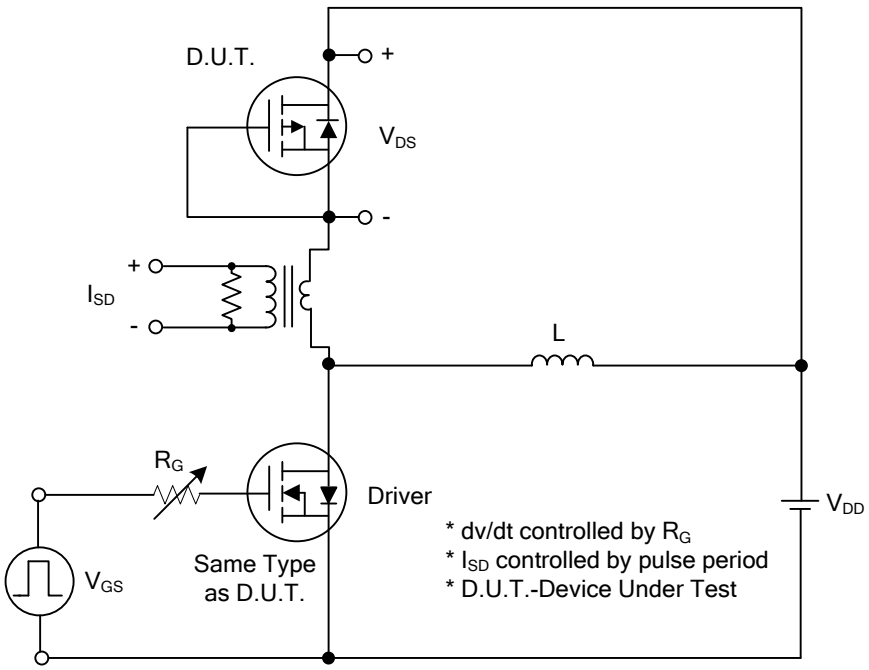
Notes: 1. The value of θ_{JA} is measured with the device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C. The value in any a given application depends on the user's specific board design. The current rating is based on the t ≤ 10s thermal resistance rating.
2. Repetitive rating, pulse width limited by junction temperature.

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

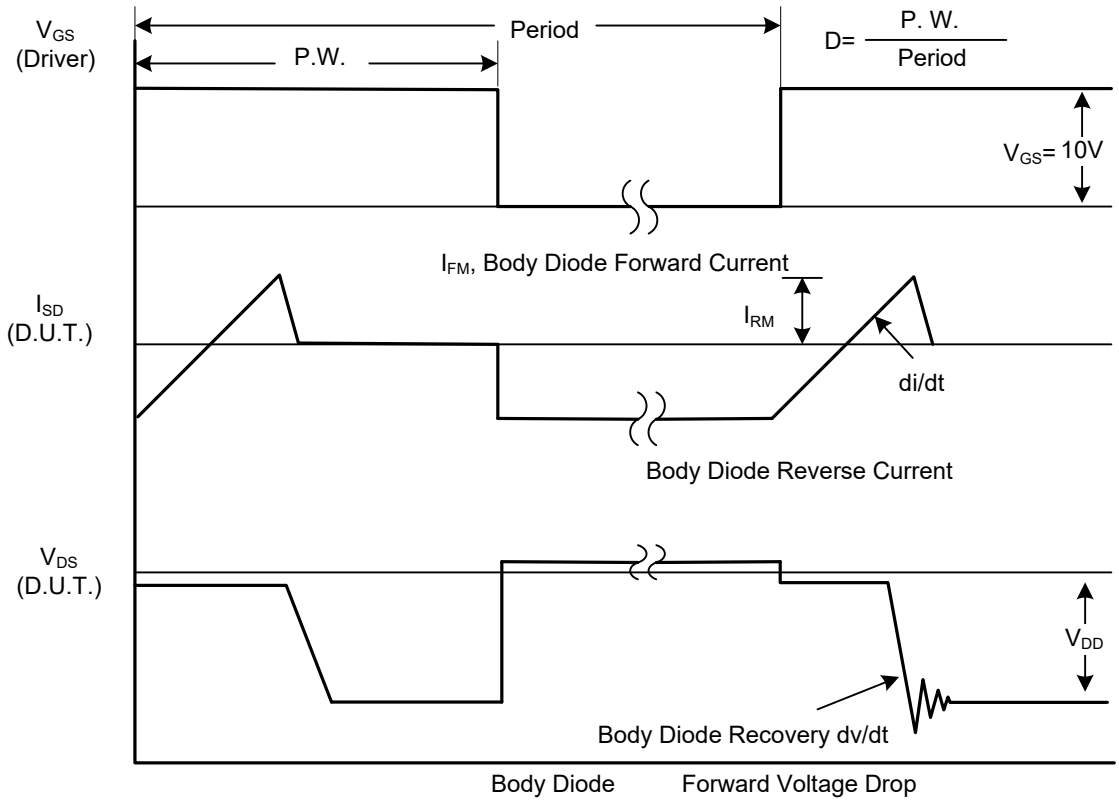
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=-250μA	-20			V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-16V,V_{GS}=0V			-0.5	μA
Gate-Source Leakage Current	I_{GSS}	V_{DS}=0V ,V_{GS}=±10V			±100	nA
		V_{DS}=0V ,V_{GS}=±12V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}= V_{GS}, I_D=-250μA	-0.5		-1.2	V
On State Drain Current	$I_{D(ON)}$	V_{GS}=-4.5V, V_{DS}=-5V	-15			A
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=-10V,I_D=-3.5A		59	75	mΩ
		V_{GS}=-4.5V, I_D=-3.0A		75	95	mΩ
		V_{GS}=-2.5V, I_D=-1.0A		135	155	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	V_{DS}=-10V,V_{GS}=0V, f =1MHz		434	620	pF
Output Capacitance	C_{OSS}			100		pF
Reverse Transfer Capacitance	C_{RSS}			82		pF
Gate Resistance	R_G	V_{GS} =0V, V_{DS} =0V, f =1MHz			13	Ω
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	V_{DS}=-10V,V_{GS}=-4.5V, I_D=-3.5A		7.0	9.0	nC
Gate-Source Charge	Q_{GS}			1.5		nC
Gate-Drain Charge	Q_{GD}			2.2		nC
Turn-ON Delay Time	$t_{D(ON)}$	V_{DS}=-10V,V_{GS}=-10V, I_D= -3.5A, R_{GEN}=3Ω		3		ns
Turn-ON Rise Time	t_R			16		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			18		ns
Turn-OFF Fall Time	t_F			20		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I_S				-2	A
Drain-Source Diode Forward Voltage	V_{SD}	I_S=-1.0A, V_{GS} =0V			-1.2	V

Notes: 1. The θ_{JA} is the sum of the thermal impedance from junction to lead θ_{JL} and lead to ambient.
2. These tests are performed with the device mounted on 1 in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The SOA curve provides a single pulse rating.

■ TEST CIRCUITS AND WAVEFORMS

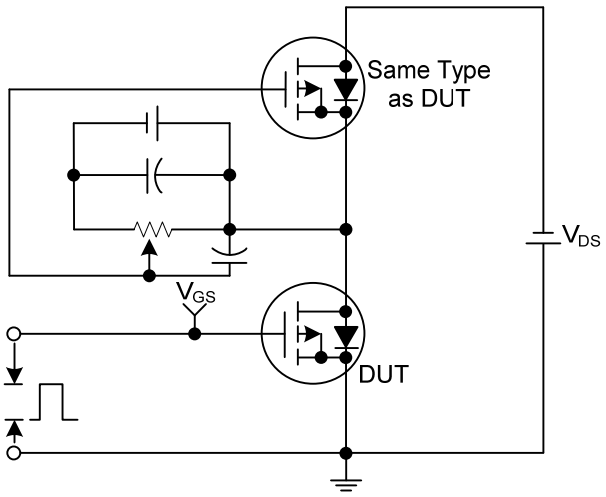


Peak Diode Recovery dv/dt Test Circuit

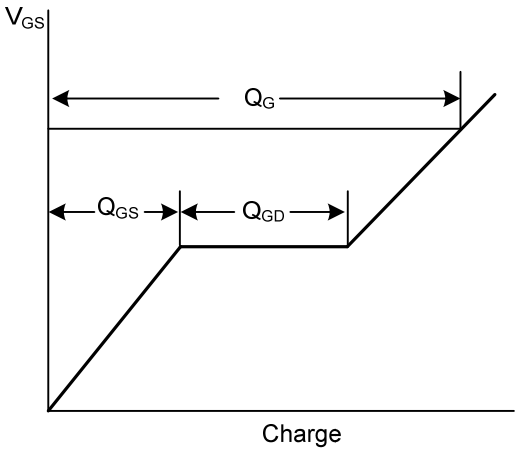


Peak Diode Recovery dv/dt Waveforms

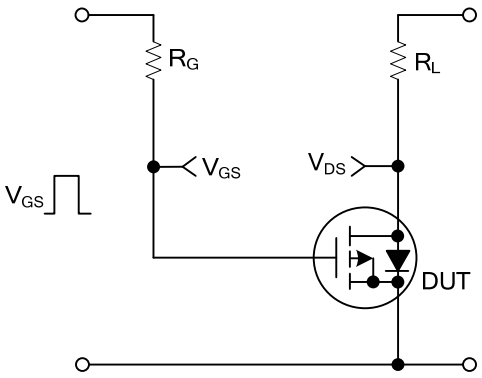
■ TEST CIRCUITS AND WAVEFORMS



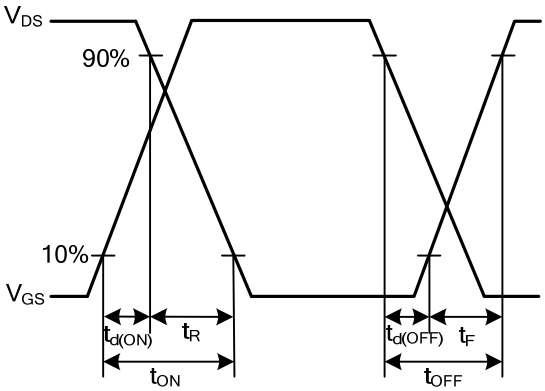
Gate Charge Test Circuit



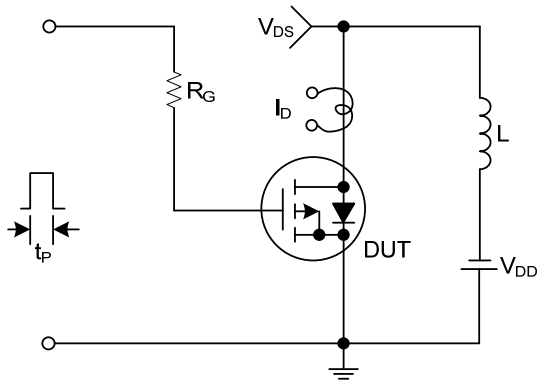
Gate Charge Waveforms



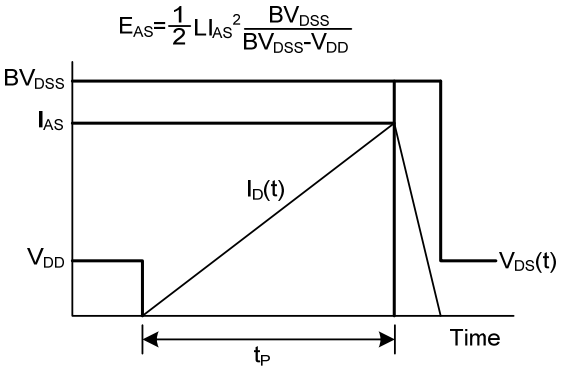
Resistive Switching Test Circuit



Resistive Switching Waveforms



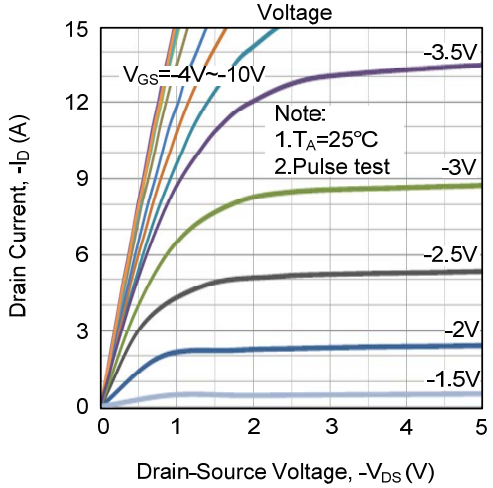
Unclamped Inductive Switching Test Circuit



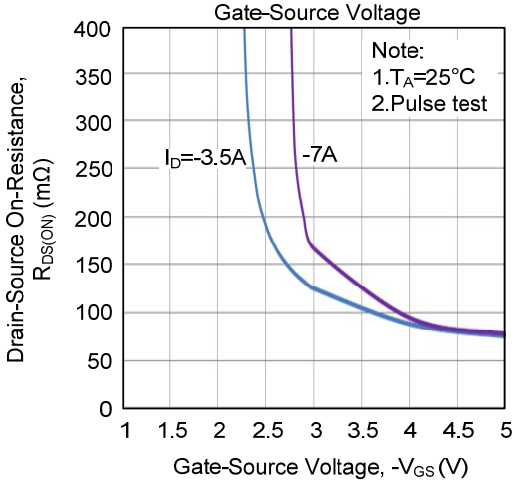
Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS

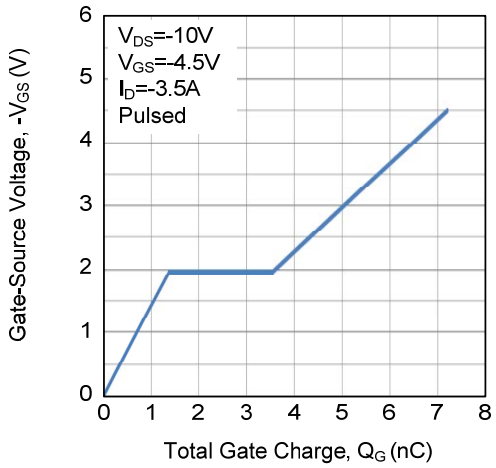
Drain Current vs. Drain-Source Voltage



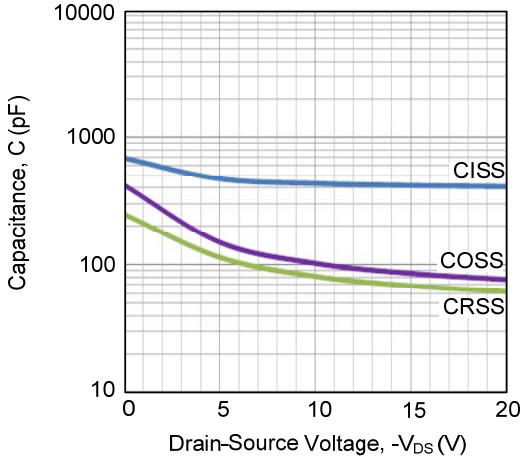
Drain-Source On-Resistance vs. Gate-Source Voltage



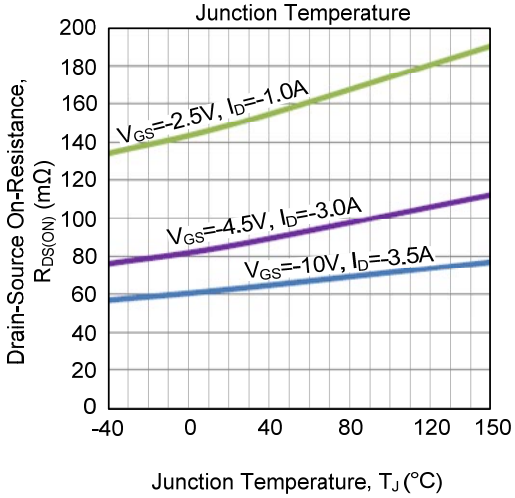
Gate Charge Characteristics



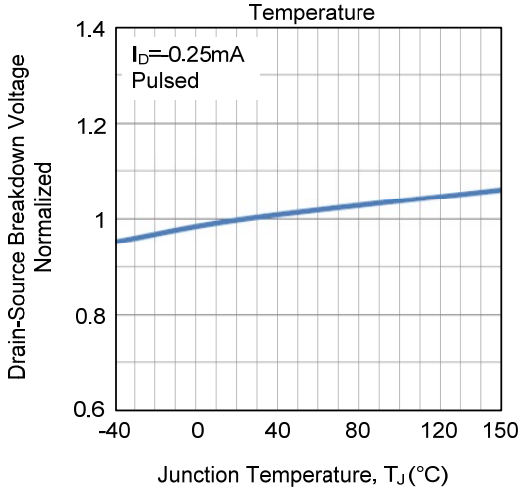
Capacitance Characteristics



Drain-Source On-Resistance vs. Junction Temperature

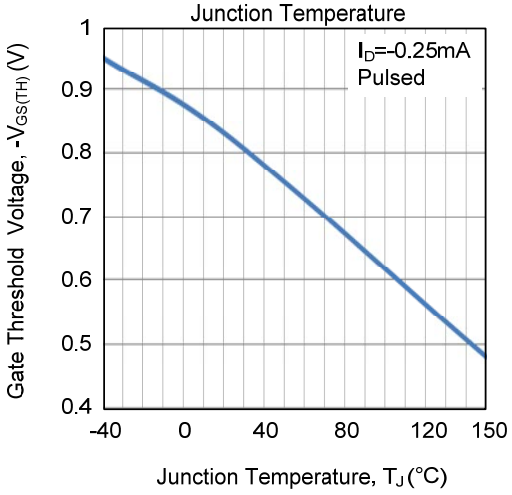


Breakdown Voltage vs. Junction Temperature

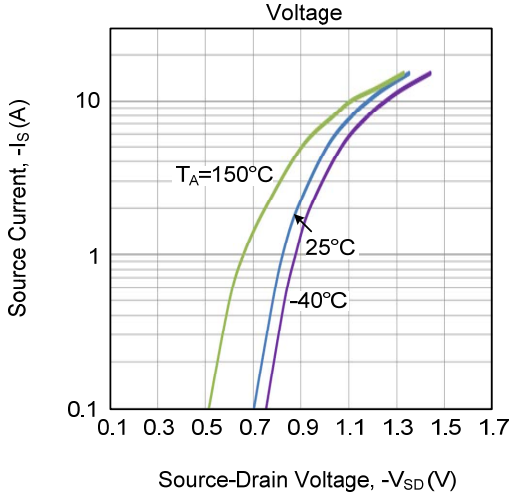


■ TYPICAL CHARACTERISTICS (Cont.)

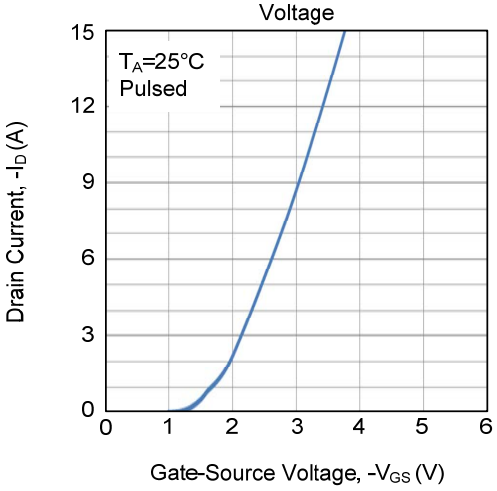
Gate Threshold Voltage vs. Junction Temperature



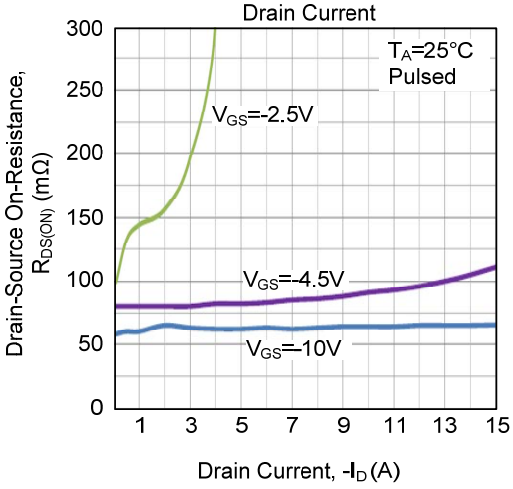
Source Current vs. Source-Drain Voltage



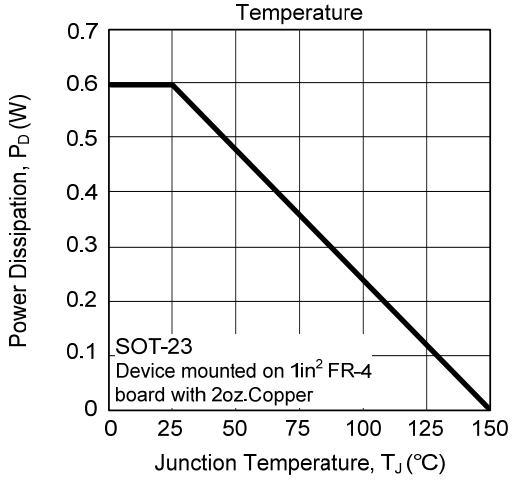
Drain Current vs. Gate-Source Voltage



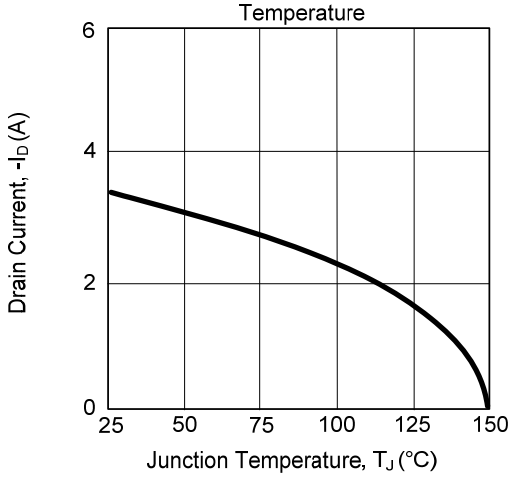
Drain-Source On-Resistance vs. Drain Current



Power Dissipation vs. Junction Temperature



Drain Current vs. Junction Temperature



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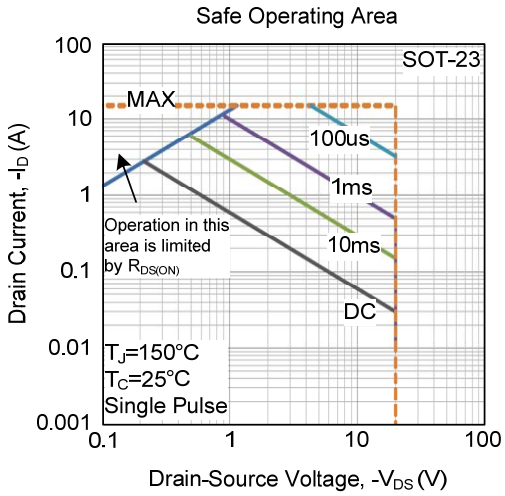

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