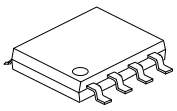
UT25N04

Power MOSFET

25A, 40V N-CHANNEL POWER MOSFET



SOP-8

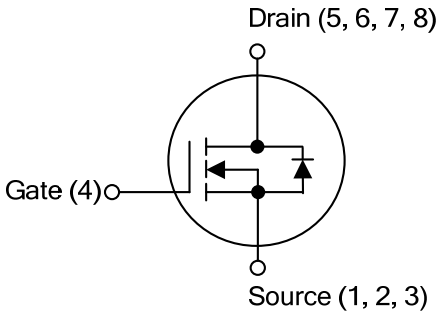
■ DESCRIPTION

The UTC **UT25N04** is a N-channel power MOSFET providing very low on-resistance. It has high efficiency and perfect cost-effectiveness. It can be generally applied in the commercial and industrial fields.

■ FEATURES

* $R_{DS(ON)} \leq 20\ m\Omega$ @ V_{GS} =10V, I_D =12.5A
  $R_{DS(ON)} \leq 26\ m\Omega$ @ V_{GS} =4.5V, I_D =12.5A
* Simple drive requirement

■ SYMBOL



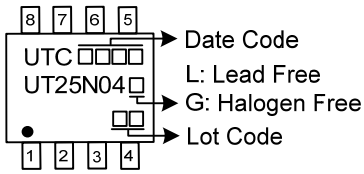
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT25N04L-S08-R	UT25N04G-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel

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

UT25N04G-S08-R (1)Packing Type	(1) R: Tape Reel
(2)Package Type	(2) S08: SOP-8
(3)Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	40	V
Gate-Source Voltage		V_{GSS}	±12	V
Drain Current	Continuous	I_D	25	A
	Pulsed (Note 2)	I_{DM}	50	A
Avalanche Energy (Note 3)	Single Pulsed (Note 3)	E_{AS}	11	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	1.9	V/ns
Power Dissipation		P_D	1.7	W
Junction Temperature		T_J	+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. Repetitive Rating: Pulse width limited by maximum junction temperature.
3. L = 0.1mH, I_{AS} = 15A, V_{DD} = 25V, R_G = 25 Ω, Starting T_J = 25°C.
4. I_{SD} ≤ 25A, di/dt ≤ 200 A/μs, V_{DD} ≤ $V_{(BR)DSS}$, T_J = 25°C.

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	125	°C/W
Junction to Case	θ_{JC}	73.5	°C/W

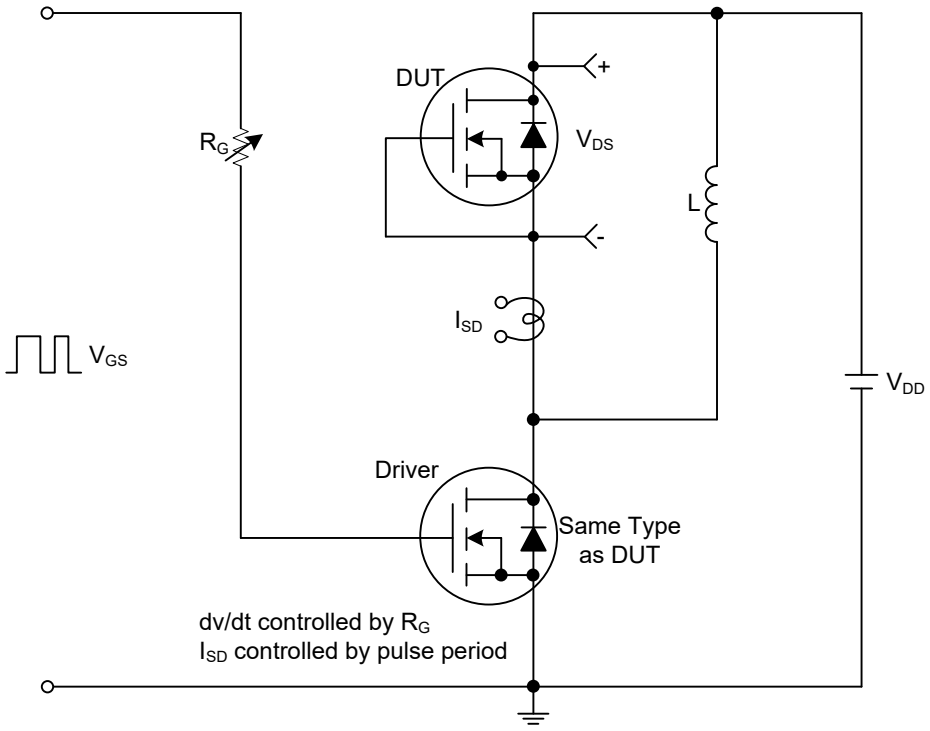
Note: Device mounted on FR-4 substrate P_C board, 2oz copper, with 1inch square copper plate.

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

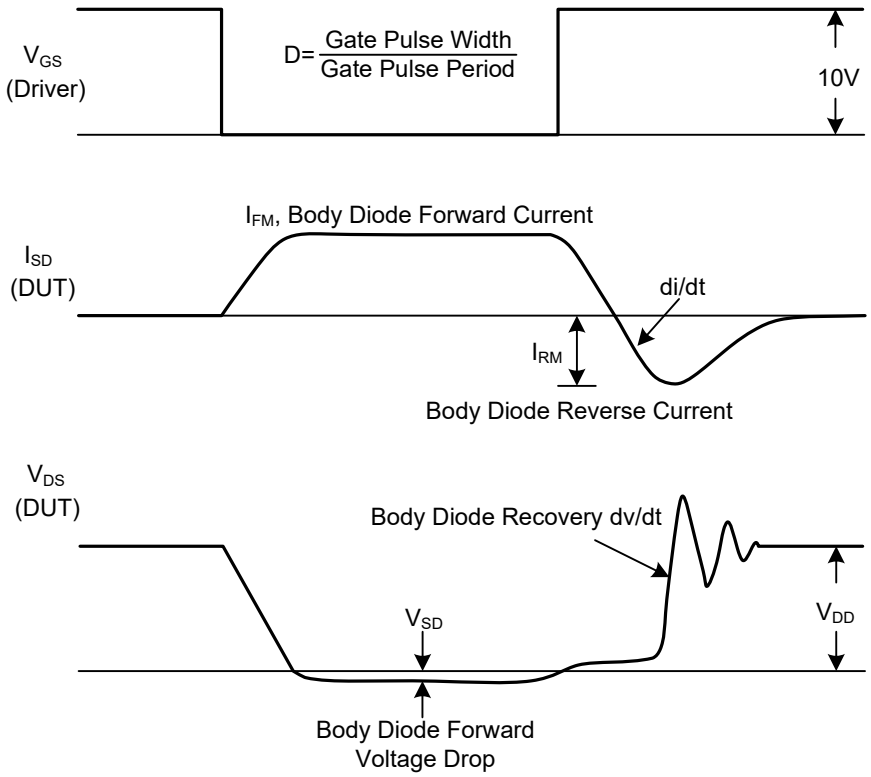
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} =0V, I_D =250μA	40			V
Drain-Source Leakage Current	I_{DSS}	V_{DS} =40V,V_{GS} =0V			1	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS} =±12V			±40	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS} =V_{GS}, I_D =250μA	1.0		3.0	V
Drain to Source On-state Resistance	$R_{DS(ON)}$	V_{GS} =10V, I_D =12.5A			20	mΩ
		V_{GS} =4.5V, I_D =12.5A			26	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	V_{DS}=25V,V_{GS}=0V, f=1.0MHz		700		pF
Output Capacitance	C_{OSS}			87		pF
Reverse Transfer Capacitance	C_{RSS}			75		pF
SWITCHING PARAMETERS						
Total Gate Charge (Note 1)	Q_G	V_{DS}=32V, V_{GS}=4.5V, I_D=25A, (Note 1, 2)		14		nC
Gate Source Charge	Q_{GS}			4.2		nC
Gate Drain Charge	Q_{GD}			7		nC
Turn-ON Delay Time (Note 1)	$t_{D(ON)}$	V_{DD}=20V, V_{GS}=10V, I_D=25A, R_G =3Ω (Note 1, 2)		4		ns
Turn-ON Rise Time	t_R			17		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			20		ns
Turn-OFF Fall-Time	t_F			19		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Continuous Drain-Source Diode Forward Current	I_S				25	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}				50	A
Drain-Source Diode Forward Voltage (Note 1)	V_{SD}	I_S =25A, V_{GS} =0V			1.4	V
Reverse Recovery Time (Note 1)	t_{rr}	I_S=25A,V_{GS}=0V, dI/dt=40A/μs		42		ns
Reverse Recovery Charge	Q_{rr}			25		nC

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

■ TEST CIRCUITS AND WAVEFORMS



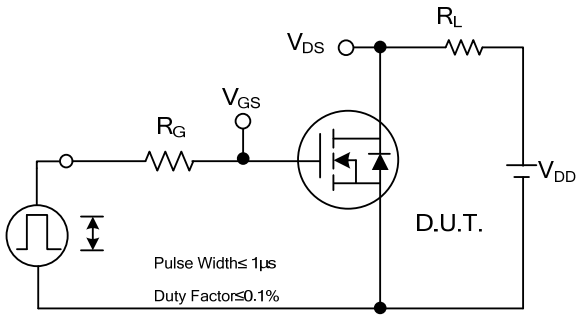
Peak Diode Recovery dv/dt Test Circuit



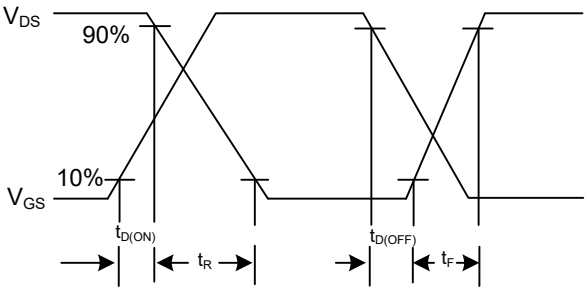
Peak Diode Recovery dv/dt Test Circuit and Waveforms

Peak Diode Recovery dv/dt Waveforms

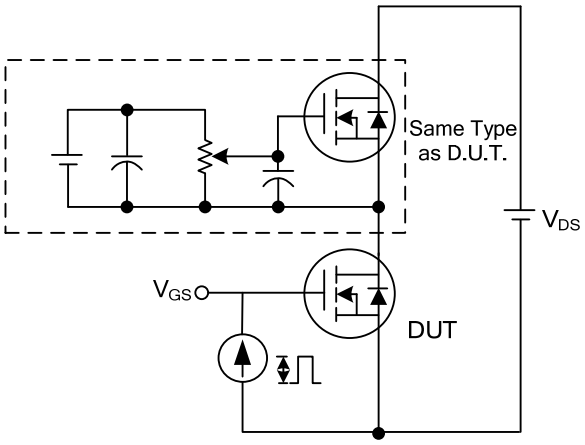
■ TEST CIRCUITS AND WAVEFORMS



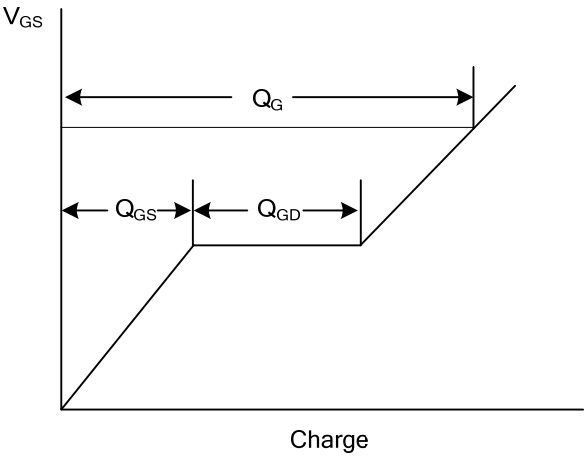
Switching Test Circuit



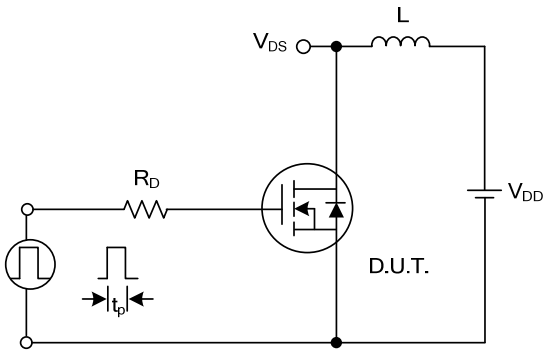
Switching Waveforms



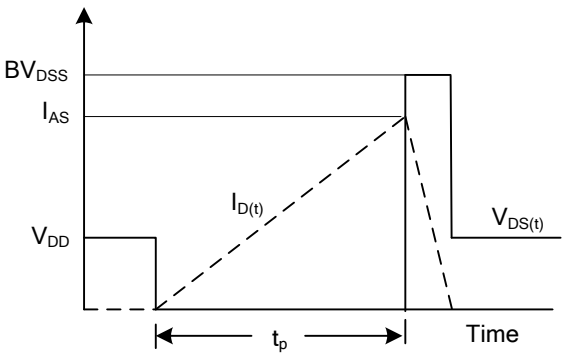
Gate Charge Test Circuit



Gate Charge Waveform

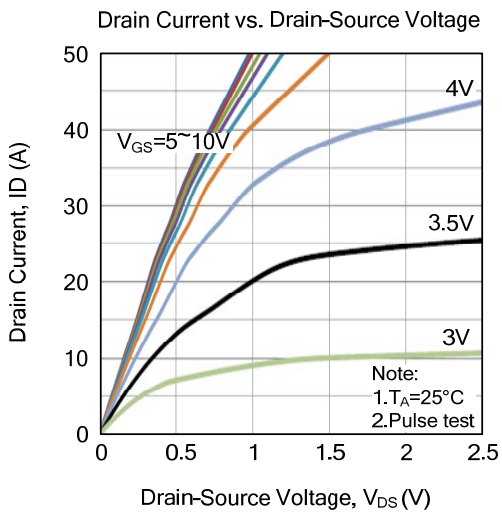


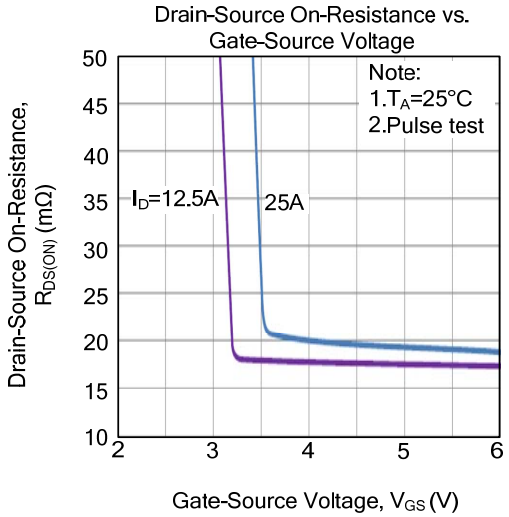
Unclamped Inductive Switching Test Circuit

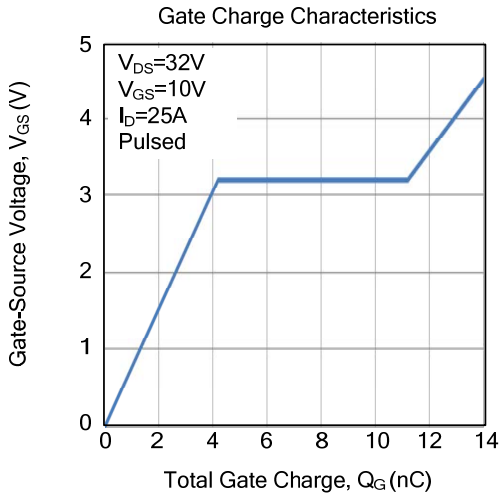


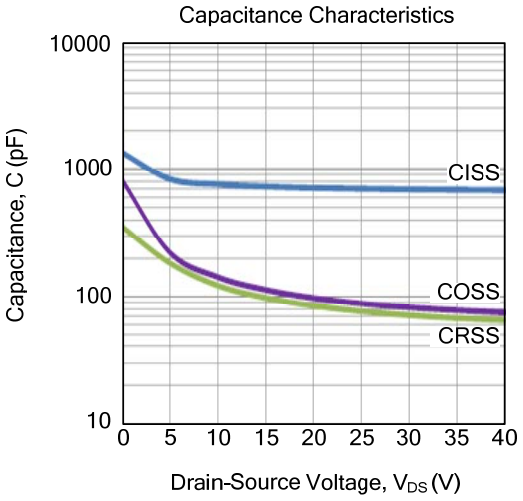
Unclamped Inductive Switching Waveforms

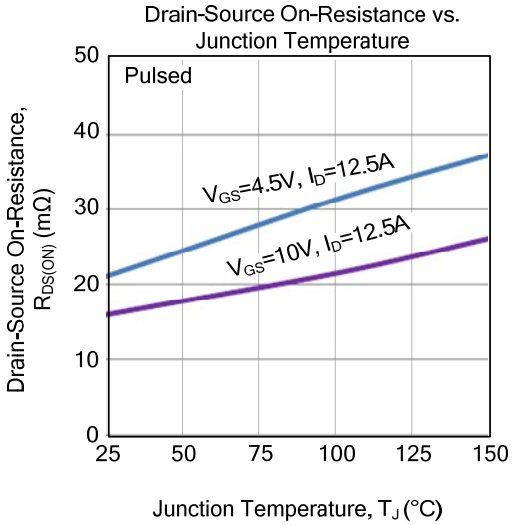
■ TYPICAL CHARACTERISTICS

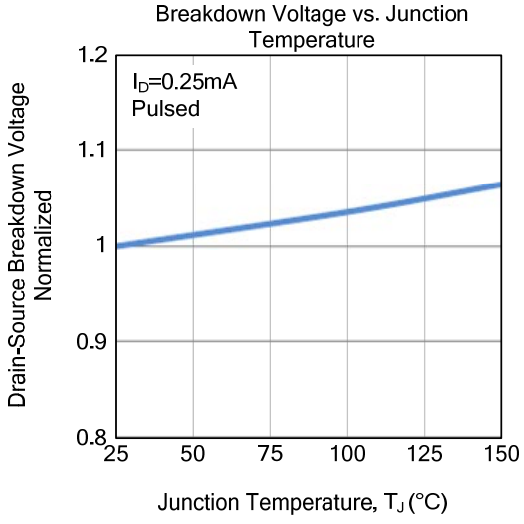






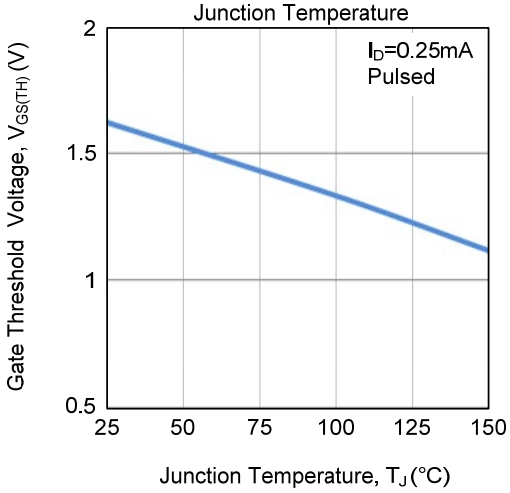




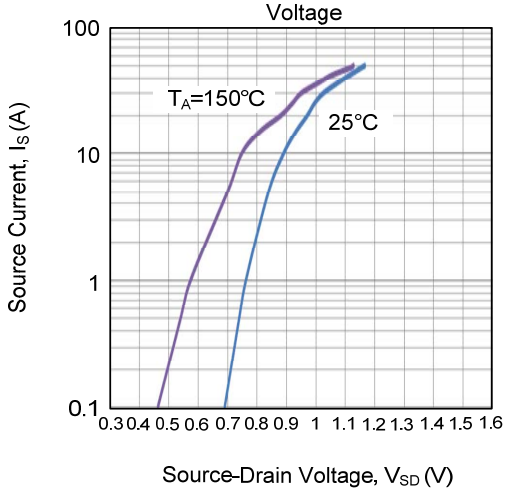


■ TYPICAL CHARACTERISTICS (Cont.)

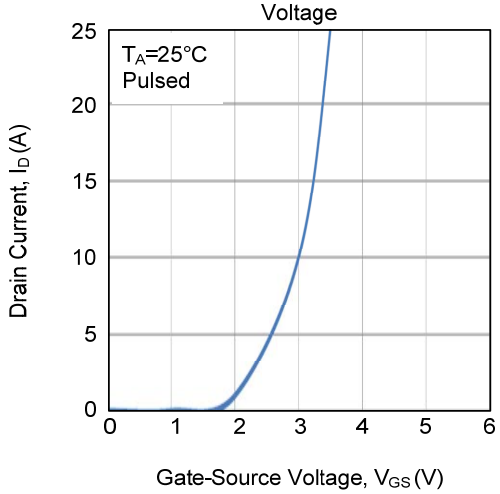
Gate Threshold Voltage vs. Junction Temperature



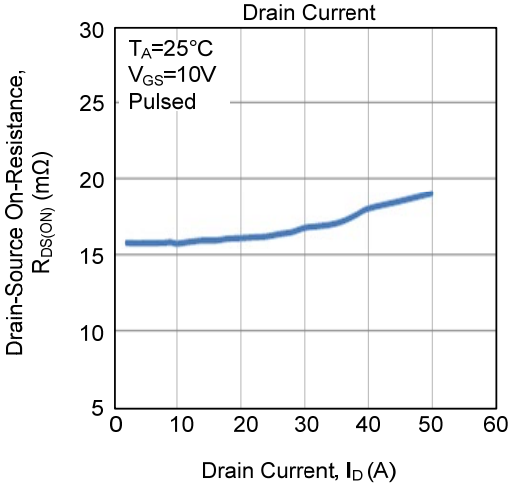
Source Current vs. Source-Drain Voltage



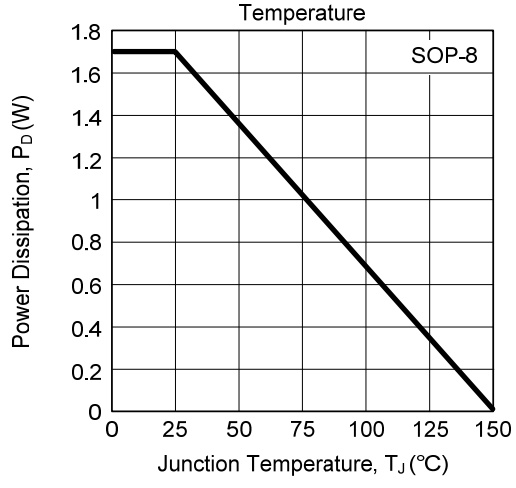
Drain Current vs. Gate-Source Voltage



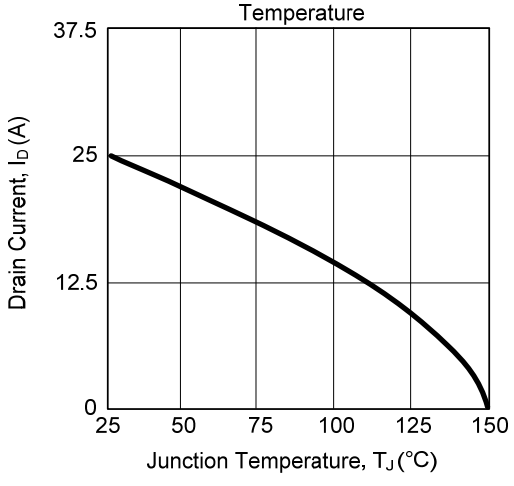
Drain-Source On-Resistance vs. Drain Current



Power Dissipation vs. Junction Temperature



Drain Current vs. Junction Temperature



■ TYPICAL CHARACTERISTICS (Cont.)