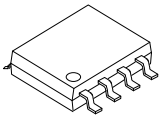
UT4422

Power MOSFET

N-CHANNEL ENHANCEMENT MODE FIELD EFFECT TRANSISTOR



SOP-8

■ DESCRIPTION

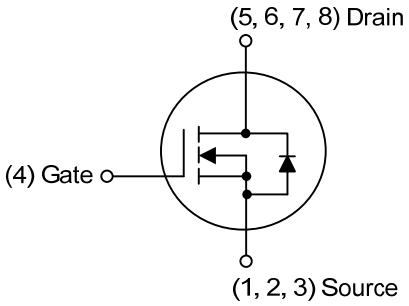
The UTC **UT4422** is a N-channel MOSFET, it uses UTC's advanced technology to provide the customers with a minimum on state resistance and high switching speed.

The UTC **UT4422** is suitable for load switch and battery protection applications.

■ FEATURES

* $R_{DS(ON)}$ ≤ 15 mΩ @ V_{GS} =10V, I_D =8.0A
  $R_{DS(ON)}$ ≤ 24 mΩ @ V_{GS} =4.5V, I_D =8.0A
* Low Capacitance
* Low Gate Charge
* Fast Switching Capability
* Avalanche Energy Specified

■ SYMBOL



■ ORDERING INFORMATION

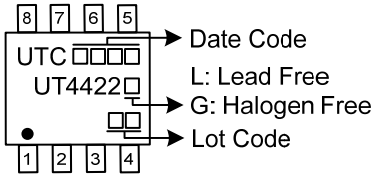
Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT4422L-S08-R	UT4422G-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel

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

UT4422G-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


8 7 6 5
UTC □□□□
UT4422□
□□
1 2 3 4
Date Code
L: Lead Free
G: Halogen Free
Lot Code

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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	30	V
Gate-Source Voltage		V_{GSS}	±20	V
Continuous Drain Current (Note 1)		I_D	11	A
Pulsed Drain Current		I_{DM}	50	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	7	mJ
Power Dissipation		P_D	1.5	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} = 11.6A, V_{DD} = 20V, R_G = 25Ω, Starting T_J = 25°C

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	90	°C/W
Junction to Case	θ_{JC}	83.3 (Note)	°C/W

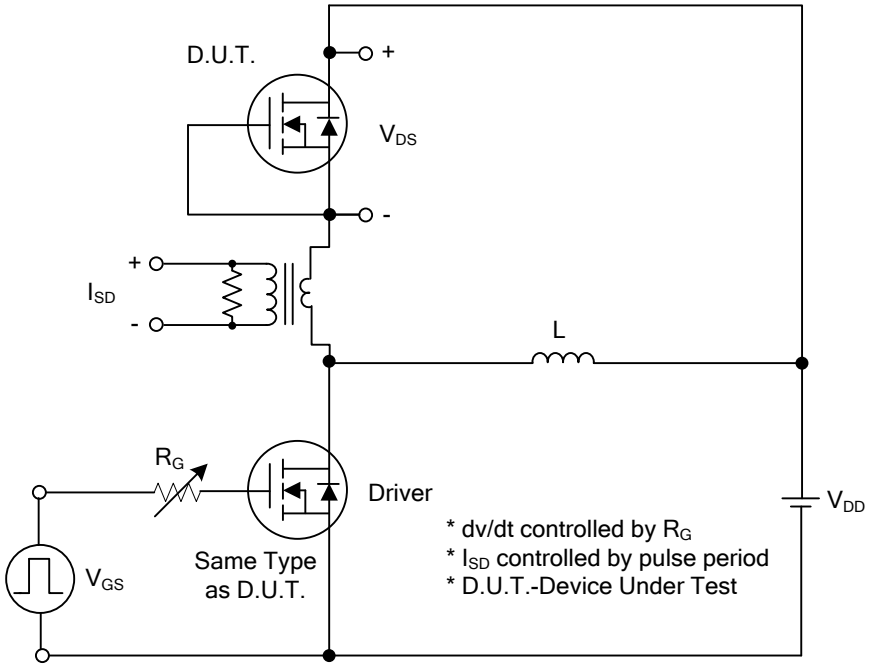
Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

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

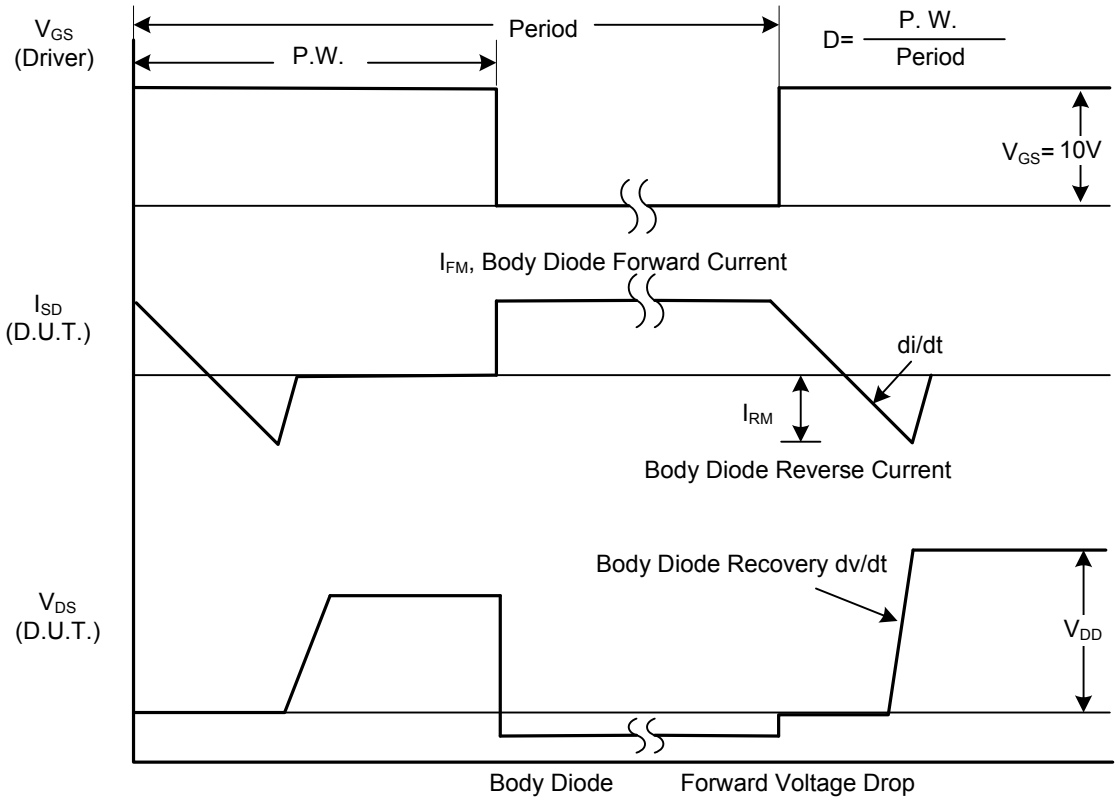
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	30			V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=30V, V_{GS}=0V			1	μA
Gate-Body Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V			100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250μA	1.0		3.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=8.0A			15	mΩ
		V_{GS}=4.5V, I_D=8.0A			24	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	V_{DS} =15V, V_{GS} =0V, f=1MHz		850		pF
Output Capacitance	C_{OSS}			201		pF
Reverse Transfer Capacitance	C_{RSS}			168		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	V_{DS} =24V, V_{GS} =10V, I_D =11A		29		nC
Gate Source Charge	Q_{GS}			4		nC
Gate Drain Charge	Q_{GD}			8		nC
Turn-ON Delay Time	$t_{D(ON)}$	V_{DS}=15V, V_{GS}=10V, I_D=11A, R_G=3.0Ω (Note 1, 2)		6		ns
Turn-ON Rise Time	t_R			18		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			22		ns
Turn-OFF Fall-Time	t_F			21		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Diode Forward Voltage	V_{SD}	I_S=11A, V_{GS}=0V			1.4	V

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

■ TEST CIRCUITS AND WAVEFORMS

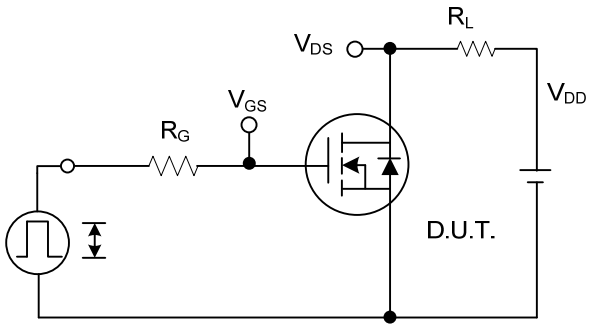


Peak Diode Recovery dv/dt Test Circuit

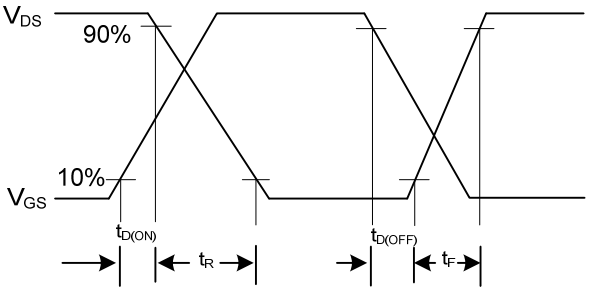


Peak Diode Recovery dv/dt Waveforms

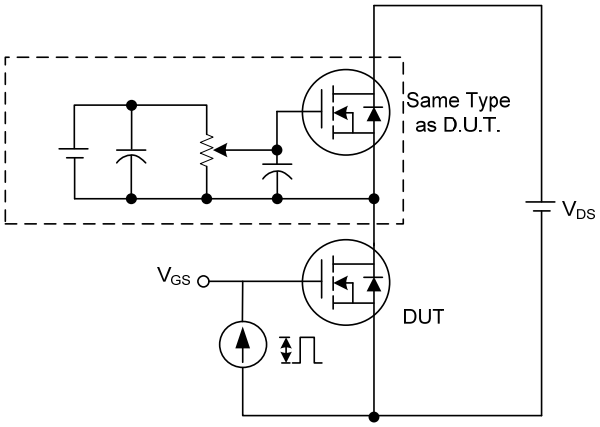
■ TEST CIRCUITS AND WAVEFORMS



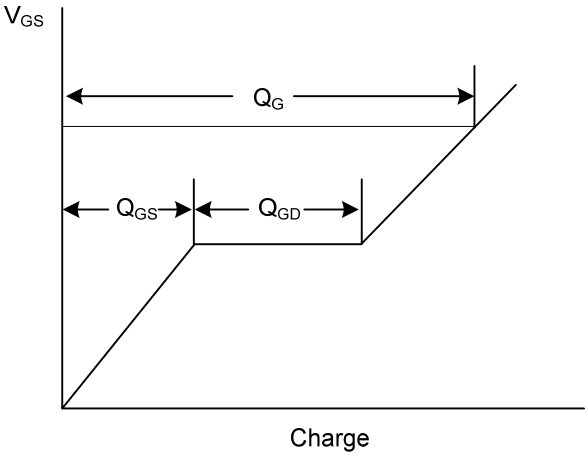
Switching Test Circuit



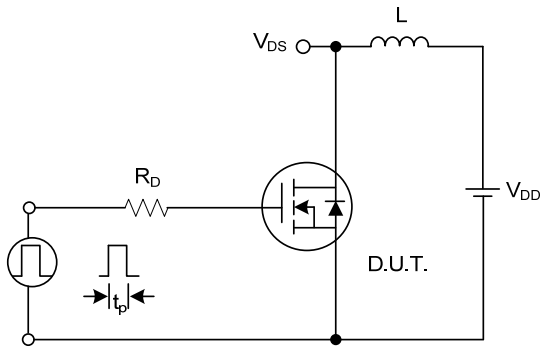
Switching Waveforms



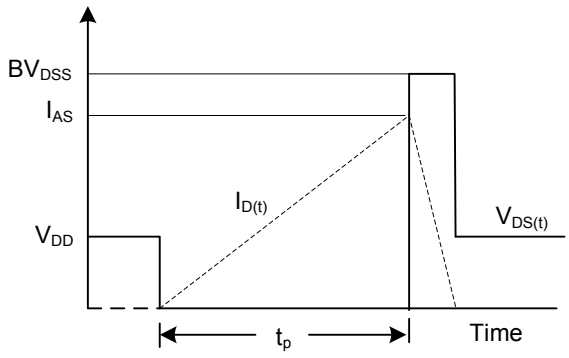
Gate Charge Test Circuit



Gate Charge Waveform

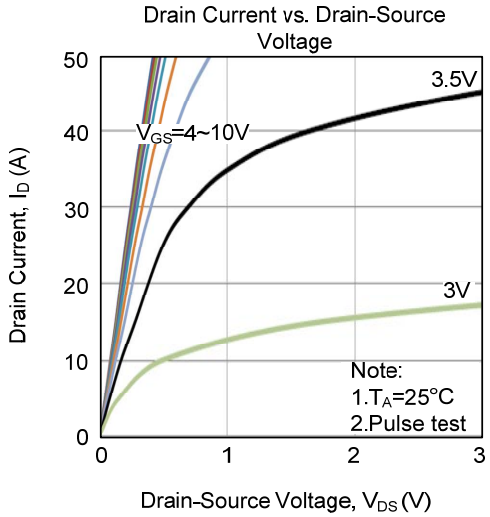


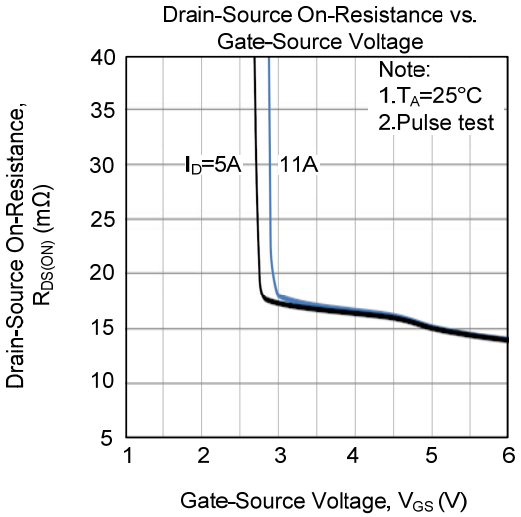
Unclamped Inductive Switching Test Circuit

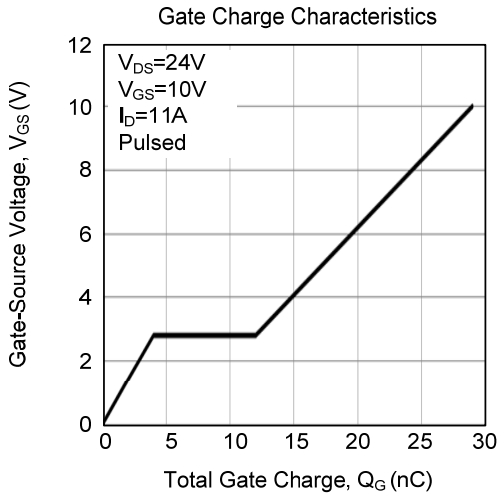


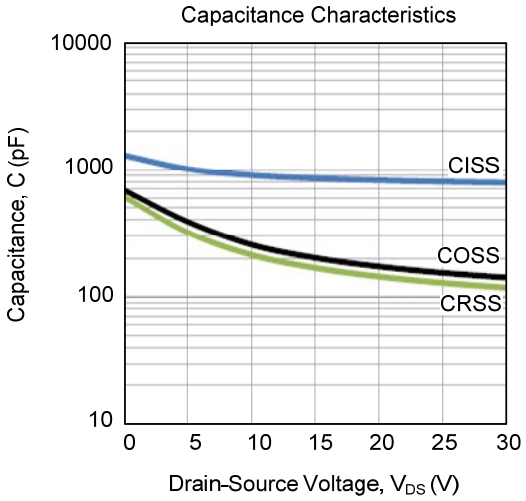
Unclamped Inductive Switching Waveforms

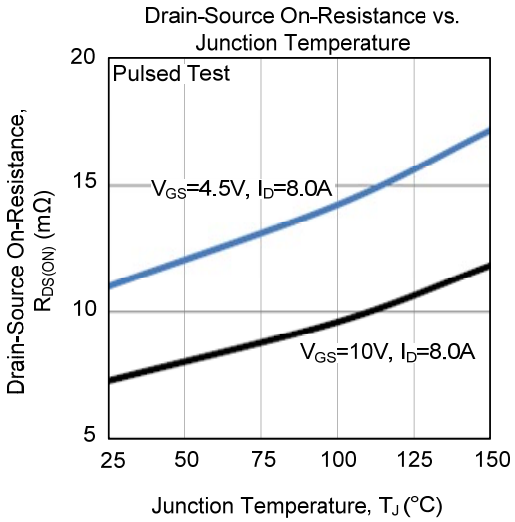
■ TYPICAL CHARACTERISTICS

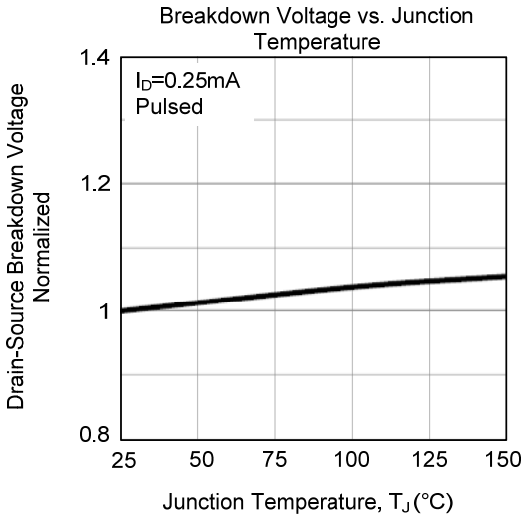






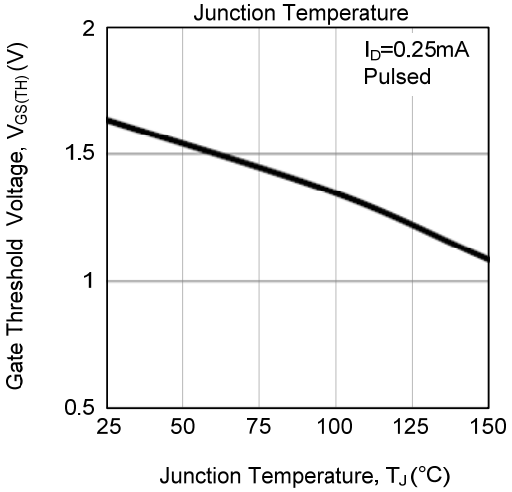




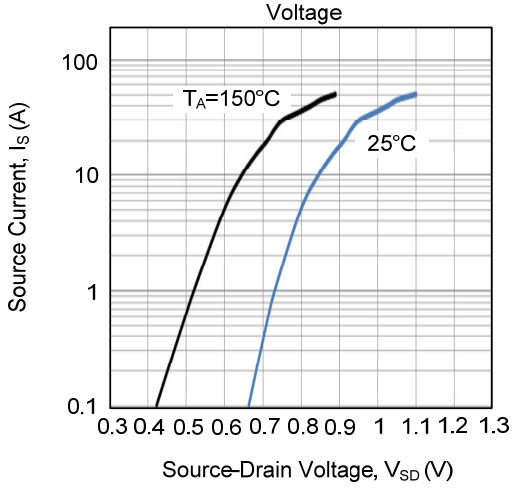


■ TYPICAL CHARACTERISTICS (Cont.)

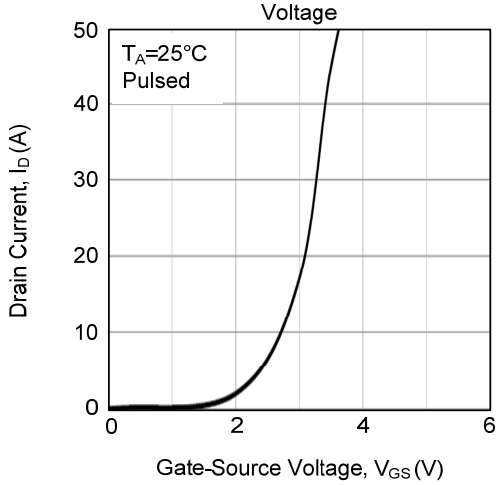
Gate Threshold Voltage vs. Junction Temperature



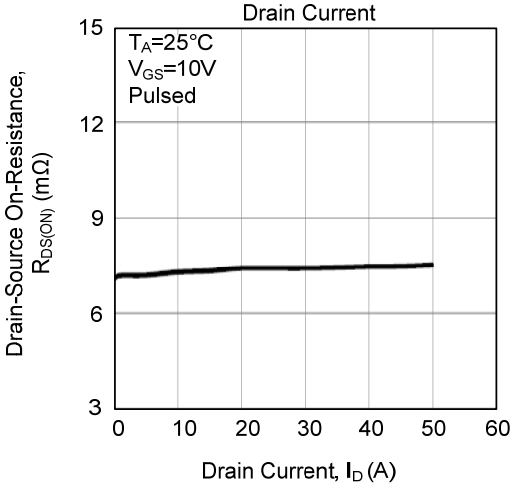
Source Current vs. Source-Drain Voltage



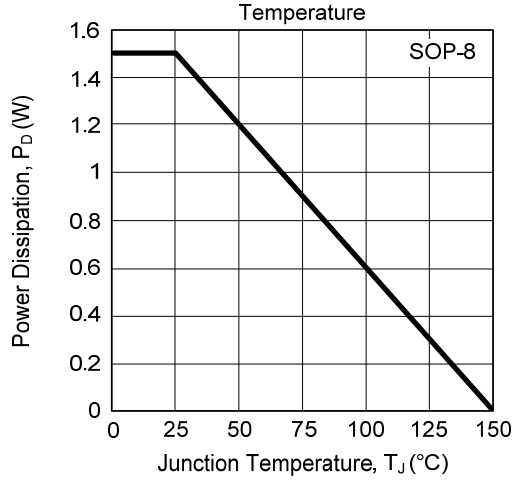
Drain Current vs. Gate-Source Voltage



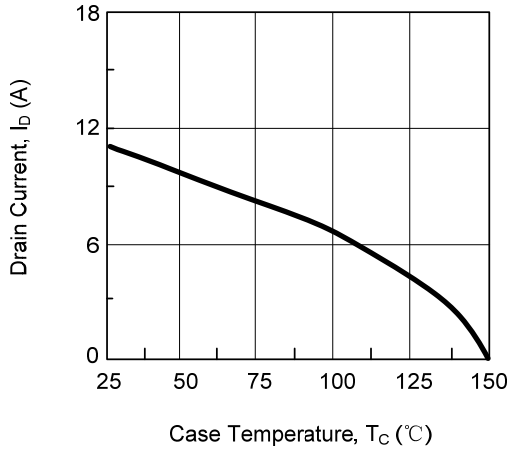
Drain-Source On-Resistance vs. Drain Current



Power Dissipation vs. Junction Temperature



Max. Drain Current vs. Case Temperature



■ TYPICAL CHARACTERISTICS (Cont.)