

**LR3XXYYB****CMOS IC****150mA 2CH LDO REGULATOR****■ DESCRIPTION**

The UTC **LR3XXYYB** are CMOS voltage regulator ICs that have high output voltage accuracy, low dropout, low supply current, and high ripple rejection. Every voltage regulator IC of UTC **LR3XXYYB** series consists of an error amplifier, a voltage reference unit, a current limit circuit, resistors for setting output voltage, and a chip enable circuit.

Due to built-in transistor with low ON resistance and a chip enable function these ICs perform with low dropout voltage prolongs the battery life of each system. The load transient response and line transient response of the UTC **LR3XXYYB** Series are excellent, so these ICs are suitable for hand-held communication equipment power supply.

■ FEATURES

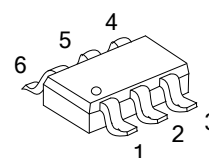
- * Low supply current: Typ. 60 μ A
- * Standby mode: Typ. 0.1 μ A
- * Low dropout voltage
- * High ripple rejection
- * Low temperature-drift coefficient of output voltage
- * Excellent line regulation
- * High output voltage accuracy
- * Output voltage stepwise setting with a step of 0.1V in the range of 1.5V ~ 3.3V is possible
- * Built-in fold-back protection circuit Typ. 40mA (current at short mode)
- * Ceramic capacitor is recommended. (1.0 μ F or more)

■ ORDERING INFORMATION

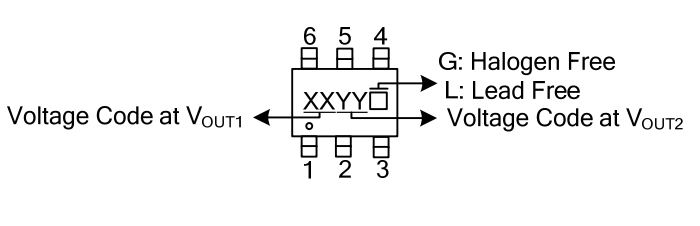
Ordering Number		Package	Packing
Lead Free	Halogen Free		
LR3XXYYBL-AG6-R	LR3XXYYBG-AG6-R	SOT-26	Tape Reel

Note: XXYY: Output Voltage, refer to Marking Information.

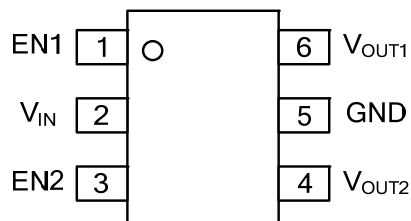
LR3XXYYBL-AG6-R		(1) R: Tape Reel
		(2) AG6: SOT-26
		(3) L: Lead Free, G: Halogen Free
		(4) XX: refer to Marking Information
		(5) YY: refer to Marking Information

**SOT-26**

MARKING INFORMATION

PACKAGE	VOLTAGE CODE		MARKING
	XX	YY	
SOT-26	12:1.2V	18:1.8V	
	12:1.2V	28:2.8V	
	15:1.5V	30:3.0V	
	15:1.5V	28:2.8V	
	15:1.5V	33:3.3V	
	18:1.8V	12:1.2V	
	18:1.8V	25:2.5V	
	18:1.8V	28:2.8V	
	18:1.8V	30:3.0V	
	18:1.8V	33:3.3V	
	28:2.8V	12:1.2V	
	28:2.8V	15:1.5V	
	28:2.8V	18:1.8V	
	28:2.8V	33:3.3V	
	33:3.3V	15:1.5V	
	33:3.3V	18:1.8V	
	33:3.3V	28:2.8V	
	33:3.3V	33:3.3V	

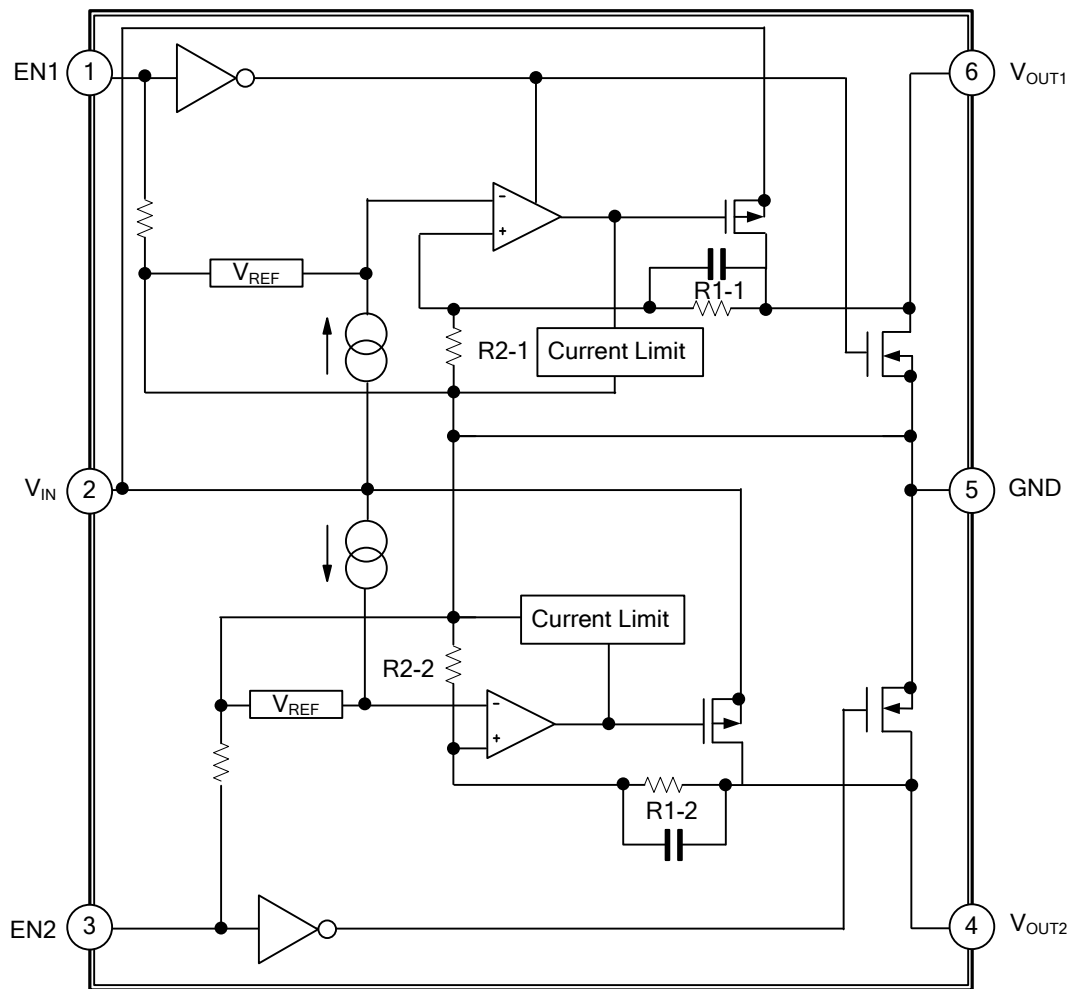
PIN CONFIGURATIONS



PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	EN1	Channel 1's output enable control Pin
2	V _{IN}	Voltage Input pin
3	EN2	Channel 2's output enable control Pin
4	V _{OUT2}	Channel 2's voltage output
5	GND	Ground
6	V _{OUT1}	Channel 1's voltage output

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V_{IN}	6.5	V
Input Voltage (EN)	V_{EN}	6.5	V
Output Voltage	V_{OUT}	$-0.3 \sim V_{IN} + 0.3$	V
Output Current	$I_{OUT1} + I_{OUT2}$	700	mA
Power Dissipation	P_D	420	mW
Operating Temperature	T_{OPR}	$-40 \sim +85$	$^{\circ}\text{C}$
Storage Temperature	T_{STG}	$-55 \sim +125$	$^{\circ}\text{C}$

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	RATING	UNIT
Junction to Ambient	θ_{JA}	250	$^{\circ}\text{C/W}$

■ ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$V_{IN} = \text{Set } V_{OUT} + 1\text{V}, 1\text{mA} \leq I_{OUT} \leq 30\text{mA}$	$V_{OUT} \times 0.98$		$V_{OUT} \times 1.02$	V
Output Current	I_{OUT}	$V_{IN} - V_{OUT} = 1.0\text{V}$	150			mA
Load Regulation	ΔV_{LOAD}	$V_{IN} = \text{Set } V_{OUT} + 1\text{V}, 1\text{mA} \leq I_{OUT} \leq 150\text{mA}$		15	40	mV
Line Regulation	ΔV_{LINE}	$\text{Set } V_{OUT} + 0.5\text{V} \leq V_{IN} \leq 6.0\text{V}, I_{OUT} = 30\text{mA}$		0.02	0.10	%/V
Dropout Voltage	V_D	Refer to the Electrical Characteristics by Output Voltage				
Supply Current	I_{SS}	$V_{IN} = \text{Set } V_{OUT} + 1\text{V}$ (Both LDOs)		90	120	μA
Supply Current (Standby)	I_{STN-BY}	$V_{IN} = \text{Set } V_{OUT} + 1\text{V}, V_{CE} = \text{GND}$		0.1	1.0	μA
Power Supply Ripple Rejection	PSRR	Ripple 0.5Vp-p, $V_{IN} = \text{Set } V_{OUT} + 1\text{V}$ $I_{OUT} = 30\text{mA}$ (In case that $V_{OUT} \leq 1.7\text{V}$, $V_{IN} = \text{Set } V_{OUT} + 1.2\text{V}$)		75 ^(Note1) 65 ^(Note2)		dB
Input Voltage	V_{IN}		2.0		6.0	V
Output Voltage Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta T_{OPR}}$	$I_{OUT} = 30\text{mA}, -40^{\circ}\text{C} \leq T_{OPR} \leq 85^{\circ}\text{C}$		± 100		ppm/ $^{\circ}\text{C}$
Short Current Limit	$I_{SC(LIMIT)}$	$V_{OUT} = 0\text{V}$		40		mA
Pull-Down Resistance for EN Pin	R_{PD}		0.7	2.0	8.0	M Ω
EN Input Voltage "H"	V_{CEH}		1.5			V
EN Input Voltage "L"	V_{CEL}				0.3	V
Output Noise	eN	BW=10Hz ~100kHz		30		μVrms
Low Output Nch Tr. ON Resistance (of B version)	R_{LOW}	$V_{CE} = 0\text{V}$		60		Ω

Notes: 1. f=1kHz, 70dB as to $V_{OUT} \geq 2.5\text{V}$ Output type.
2. f=10kHz, 60dB as to $V_{OUT} \geq 2.5\text{V}$ Output type.

■ ELECTRICAL CHARACTERISTICS BY OUTPUT VOLTAGE

Output Voltage V_{OUT} (V)	Dropout Voltage, V_D (V)		
	CONDITION	TYP	MAX
$V_{OUT} = 1.2$	$I_{OUT} = 150\text{mA}$	0.40	0.75
$V_{OUT} = 1.5$		0.38	0.70
$V_{OUT} = 1.6$		0.35	0.65
$V_{OUT} = 1.7$		0.33	0.60
$1.8 \leq V_{OUT} \leq 2.0$		0.32	0.55
$2.1 \leq V_{OUT} \leq 2.7$		0.28	0.50
$2.8 \leq V_{OUT} \leq 3.3$		0.22	0.35

■ TEST CIRCUITS

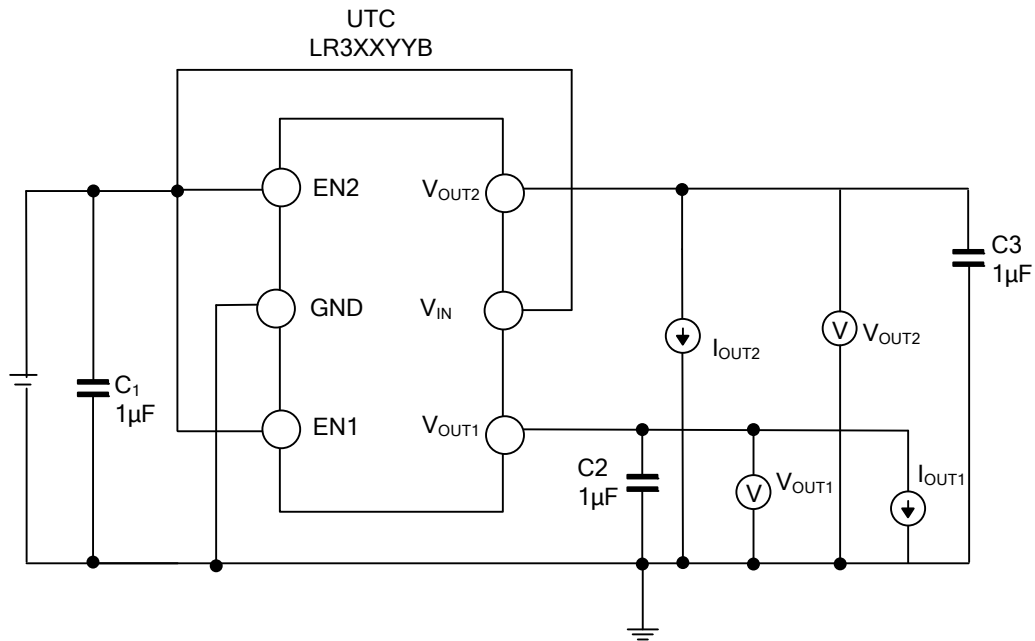


Fig.1 Standard Test Circuit

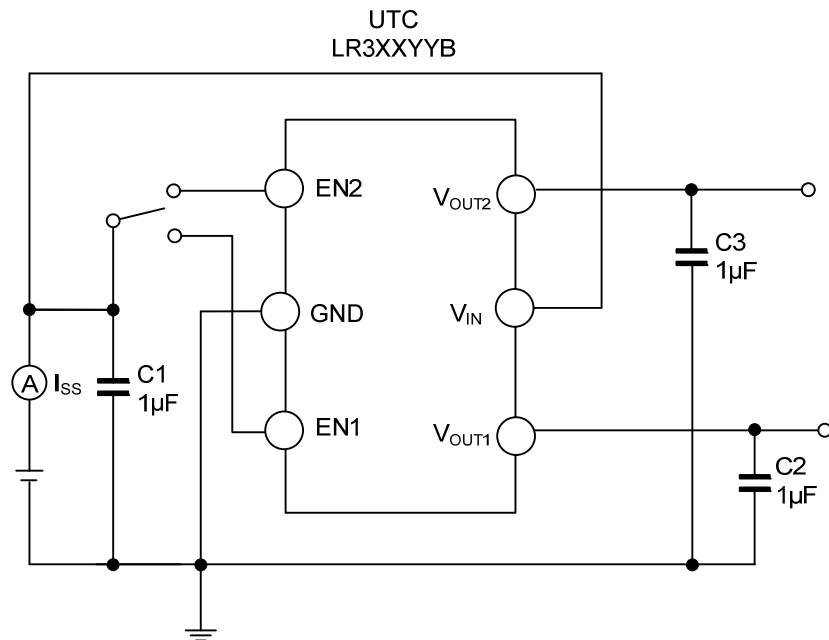


Fig.2 Supply Current Test Circuit

■ TEST CIRCUITS(Cont.)

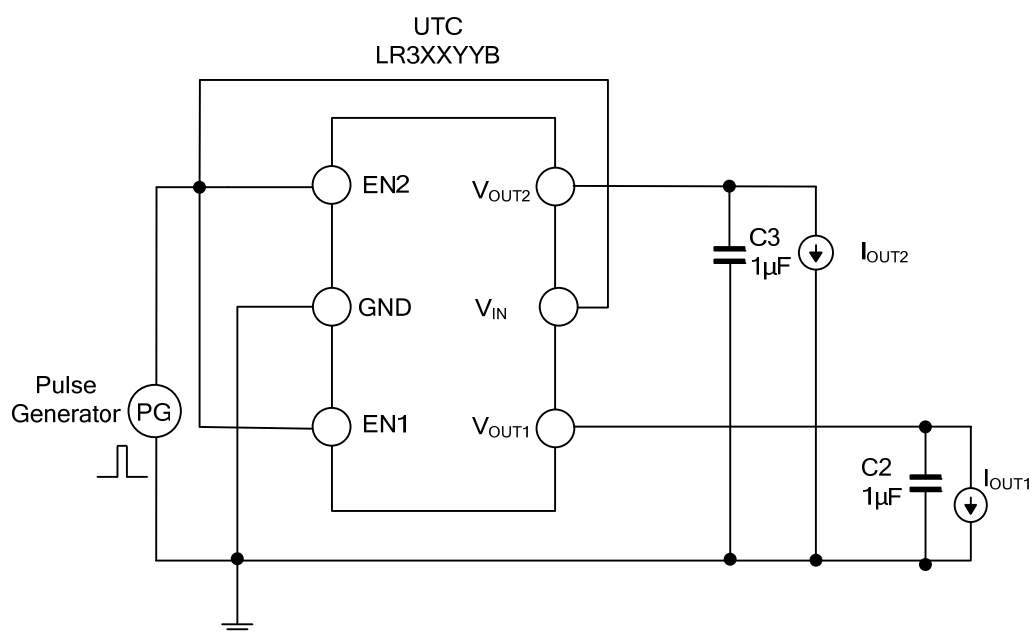


Fig.3 Ripple Rejection, Line Transient Response Test Circuit

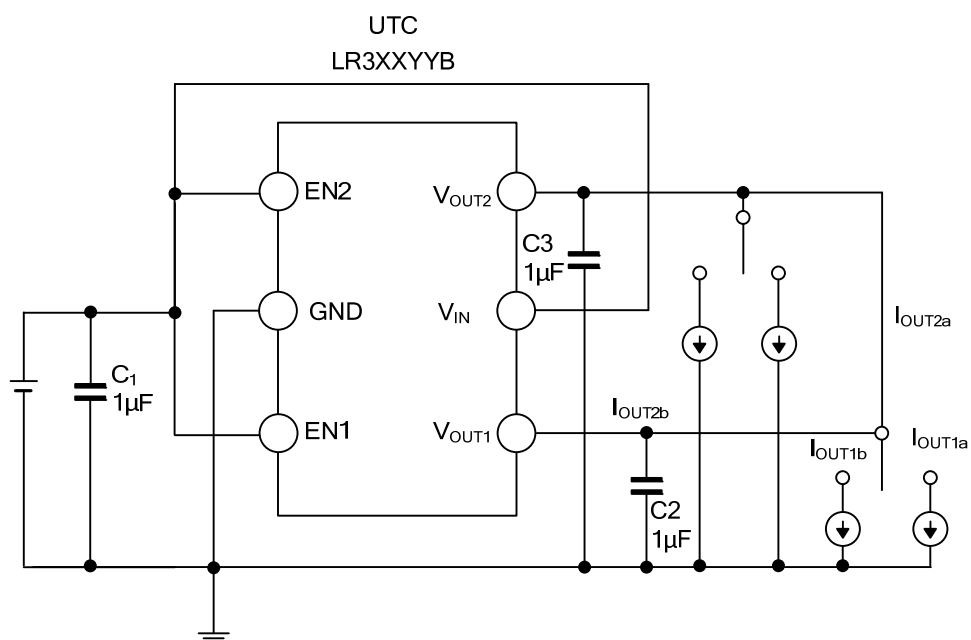
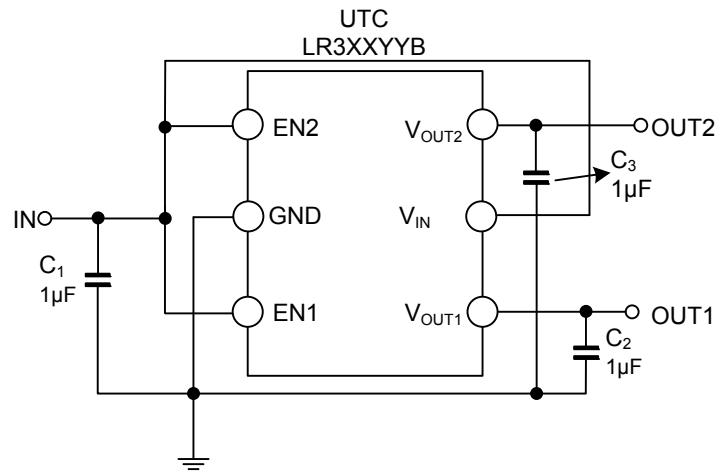
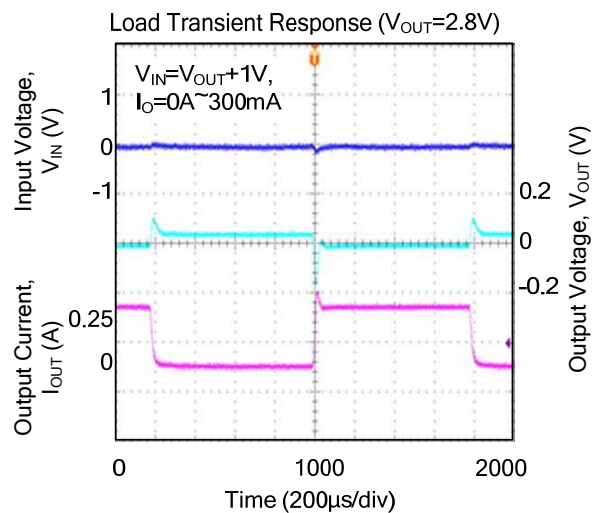
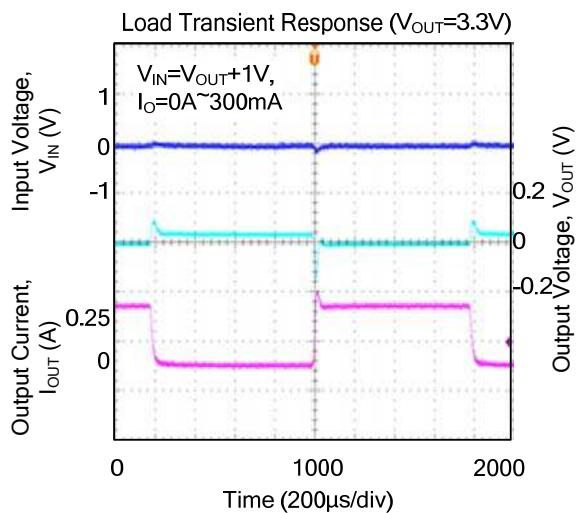
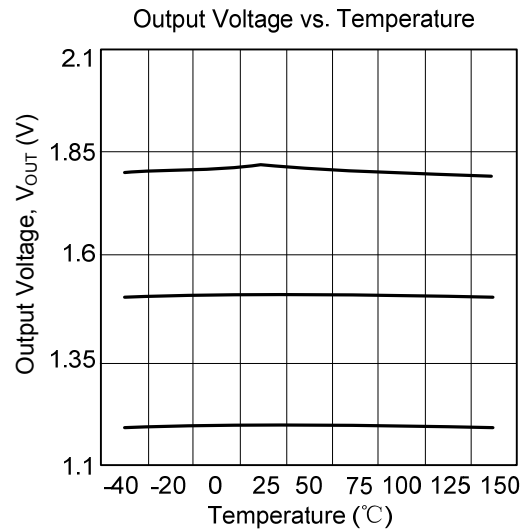
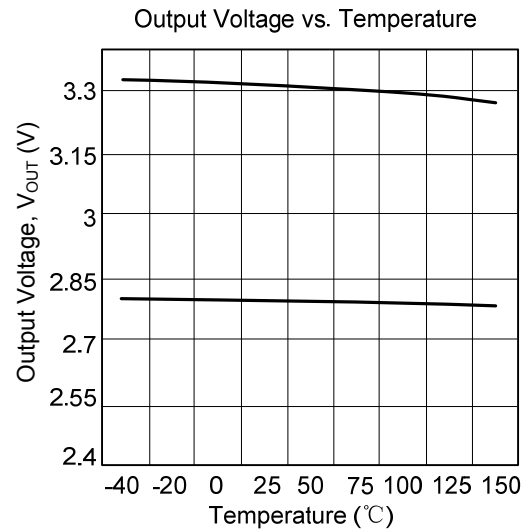


Fig.4 Load Transient Response Test Circuit

■ TYPICAL APPLICATION CIRCUIT



TYPICAL CHARACTERISTICS



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