



82CXX

CMOS IC

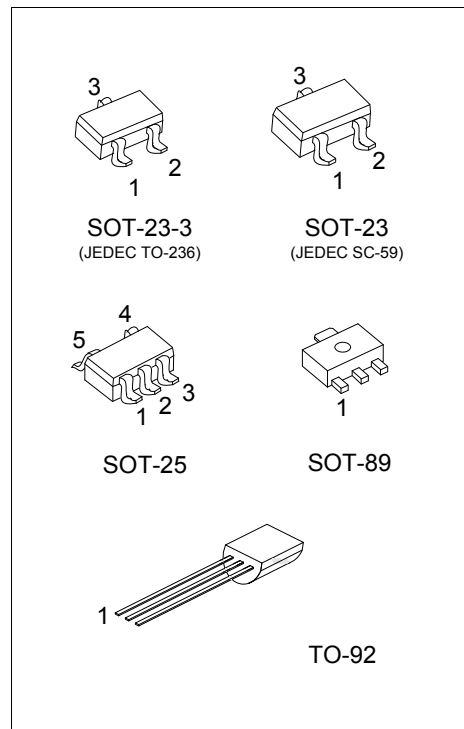
VOLTAGE DETECTORS

DESCRIPTION

The UTC **82CXX** series are good performance 3-terminals voltage detectors and manufactured by CMOS technologies with highly accurate, low power consumption. The detection voltage is extremely accurate with minimal temperature drift.

FEATURES

- *High-accuracy detection voltage : $\pm 2\%$
- *Detect voltage range : 1.3V to 6.2V in 0.1V increments
- *Detect voltage temperature characteristics: TYP. $\pm 100\text{ppm}/^\circ\text{C}$.
- *Wide operating voltage range : 0.7V to 10.0V
- *Low current consumption : TYP 0.7 μA (at $V_{\text{IN}}=1.5\text{V}$)



ORDERING INFORMATION

Ordering Number		Package	Pin Assignment					Packing
Lead Free	Halogen-Free		1	2	3	4	5	
82CXXL-AB3-5-R	82CXXG-AB3-5-R	SOT-89	G	O	I	-	-	Tape Reel
82CXXL-AB3-E-R	82CXXG-AB3-E-R	SOT-89	O	I	G	-	-	Tape Reel
82CXXL-AE3-5-R	82CXXG-AE3-5-R	SOT-23	O	G	I	-	-	Tape Reel
82CXXL-AE2-5-R	82CXXG-AE2-5-R	SOT-23-3	O	G	I			Tape Reel
82CXXL-AF5-R	82CXXG-AF5-R	SOT-25	O	I	G	N	N	Tape Reel
82CXXL-T92-D-B	82CXXG-T92-D-B	TO-92	I	G	O	-	-	Tape Box
82CXXL-T92-D-K	82CXXG-T92-D-K	TO-92	I	G	O	-	-	Bulk
82CXXL-T92-E-B	82CXXG-T92-E-B	TO-92	O	I	G	-	-	Tape Box
82CXXL-T92-E-K	82CXXG-T92-E-K	TO-92	O	I	G	-	-	Bulk

Note: 1. Pin assignment: G: V_{SS} O: V_{OUT} I: V_{IN} N: NC

2. XX: Output Voltage, refer to Marking Information

<p>82CXXG-AB3-E-R</p> <p>(1)Packing Type (2)Pin Assignment (3)Package Type (4)Green Package (5)Output Voltage Code</p>	<p>(1) B: Tape Box, K: Bulk, R: Tape Reel (2) refer to Pin Assignment (3) AB3: SOT-89, AE3: SOT-23, AE2: SOT-23-3 AF5: SOT-25, T92: TO-92 (4) G: Halogen Free and Lead Free, L: Lead Free (5) XX: refer to Marking Information</p>
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MARKING INFORMATION

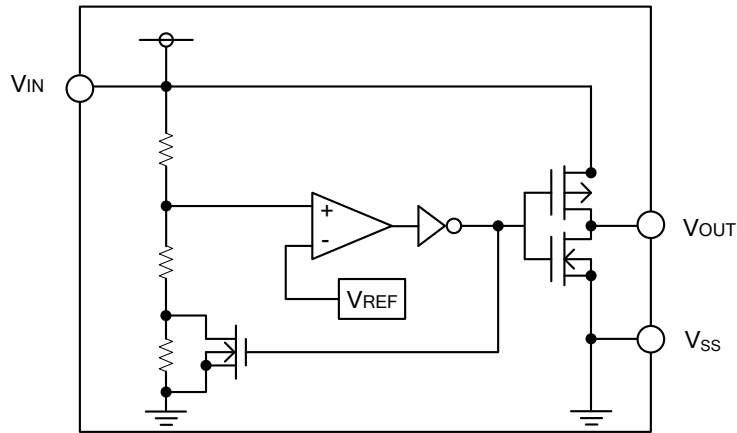
PACKAGE	VOLTAGE CODE		MARKING
SOT-89	13:1.3V 14:1.4V 15:1.5V 16:1.6V 17:1.7V 18:1.8V	38:3.8V 39:3.9V 40:4.0V 41:4.1V 42:4.2V 43:4.3V	<p>Pin Code Date Code C: CMOS Voltage Code L: Lead Free G: Halogen Free</p>
SOT-23 SOT-23-3	19:1.9V 20:2.0V 21:2.1V 22:2.2V 23:2.3V 24:2.4V 25:2.5V	44:4.4V 45:4.5V 46:4.6V 47:4.7V 48:4.8V 49:4.9V 50:5.0V	<p>Voltage Code L: Lead Free G: Halogen Free</p>
SOT-25	26:2.6V 27:2.7V 28:2.8V 29:2.9V 30:3.0V 31:3.1V 32:3.2V	51:5.1V 52:5.2V 53:5.3V 54:5.4V 55:5.5V 56:5.6V 57:5.7V	<p>Voltage Code L: Lead Free G: Halogen Free</p>
TO-92	33:3.3V 34:3.4V 35:3.5V 36:3.6V 37:3.7V	58:5.8V 59:5.9V 60:6.0V 62:6.2V	<p>L: Lead Free G: Halogen Free C: CMOS Pin Code Voltage Code Date Code</p>

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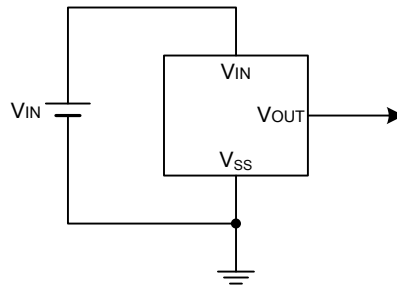
■ MARKING CODE FOR SOT-23/SOT-25

PART NUMBER	DETECT VOLATGE		MARKING CODE	PART NUMBER	DETECT VOLATGE		MARKING CODE
	VOLTAGE	CODE			VOLTAGE	CODE	
82C12	1.2V	12	L12	82C37	3.7V	37	L37
82C13	1.3V	13	L13	82C38	3.8V	38	L38
82C14	1.4V	14	L14	82C39	3.9V	39	L39
82C15	1.5V	15	L15	82C40	4.0V	40	L40
82C16	1.6V	16	L16	82C41	4.1V	41	L41
82C17	1.7V	17	L17	82C42	4.2V	42	L42
82C18	1.8V	18	L18	82C43	4.3V	43	L43
82C19	1.9V	19	L19	82C44	4.4V	44	L44
82C20	2.0V	20	L20	82C45	4.5V	45	L45
82C21	2.1V	21	L21	82C46	4.6V	46	L46
82C22	2.2V	22	L22	82C47	4.7V	47	L47
82C23	2.3V	23	L23	82C48	4.8V	48	L48
82C24	2.4V	24	L24	82C49	4.9V	49	L49
82C25	2.5V	25	L25	82C50	5.0V	50	L50
82C26	2.6V	26	L26	82C51	5.1V	51	L51
82C27	2.7V	27	L27	82C52	5.2V	52	L52
82C28	2.8V	28	L28	82C53	5.3V	53	L53
82C29	2.9V	29	L29	82C54	5.4V	54	L54
82C30	3.0V	30	L30	82C55	5.5V	55	L55
82C31	3.1V	31	L31	82C56	5.6V	56	L56
82C32	3.2V	32	L32	82C57	5.7V	57	L57
82C33	3.3V	33	L33	82C58	5.8V	58	L58
82C34	3.4V	34	L34	82C59	5.9V	59	L59
82C35	3.5V	35	L35	82C60	6.0V	60	L60
82C36	3.6V	36	L36	82C62	6.2V	62	L62

■ BLOCK DIAGRAM



■ TYPICAL APPLICATION CIRCUITS



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

PARAMETER		SYMBOL	RATINGS	UNIT
Input Voltage		V _{IN}	12	V
Output Current		I _{OUT}	50	mA
Output Voltage		V _{OUT}	V _{SS} -0.3 ~ V _{IN} +0.3	V
Power Dissipation	SOT-23-3/SOT-23	P _D	150	mW
	SOT-25		500	mW
	SOT-89		300	mW
	TO-92			
Operating Temperature		T _{OPR}	-40 ~ +85	°C
Storage Temperature		T _{STG}	-40 ~ +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.

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

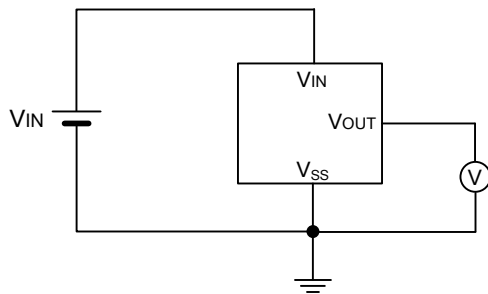
PARAMETER	SYMBOL	CIRCUIT	TEST CONDITONS	MIN	TYP	MAX	UNIT
Detect Voltage (Note 2)	V _{DF}	1		V _{DF} ×0.98	V _{DF}	V _{DF} ×1.02	V
Hysteresis Range	V _{HYS}	1		V _{DF} ×0.02	V _{DF} ×0.05	V _{DF} ×0.08	V
Supply Current	I _{SS}	2	V _{IN} =1.5V		0.7	2.3	μA
			V _{IN} =2.0V		0.8	2.7	μA
			V _{IN} =3.0V		0.9	3.0	μA
			V _{IN} =4.0V		1.0	3.2	μA
			V _{IN} =5.0V		1.1	3.6	μA
Operating Voltage	V _{IN}	1	V _{DF(T)} =1.3V ~ 1.5V	0.7		6	V
			V _{DF(T)} =1.6V ~ 6.2V	0.7		10	V
Output Current (V _{DF} ≤1.5V)	I _{OUT}	3	N-ch, V _{DS} =0.5V, V _{IN} =0.7V	0.1	0.8		mA
		4	P-ch, V _{DS} =2.1V, V _{IN} =6.0V		-7.5	-1.5	mA
Output Current (V _{DF} ≥1.6V)	I _{OUT}	3	N-ch, V _{DS} =0.5V	V _{IN} =2.0V	3.0	7.7	mA
				V _{IN} =3.0V	5.0	10.1	mA
				V _{IN} =4.0V	6.0	11.5	mA
				V _{IN} =5.0V	7.0	13.0	mA
		4	P-ch, V _{DS} =2.1V, V _{IN} =8.0V		-10.0	-2	mA
Temperature Characteristics	$\frac{\Delta V_{DF}}{\Delta T_{OPR} \times V_{DF}}$		-40°C≤T _{OPR} ≤85°C		±100		ppm/°C
Transient Delay Time	t _{DLY}	5				0.2	ms

Notes: 1. Detect voltage of ±1% tolerance is also available per customer's request.

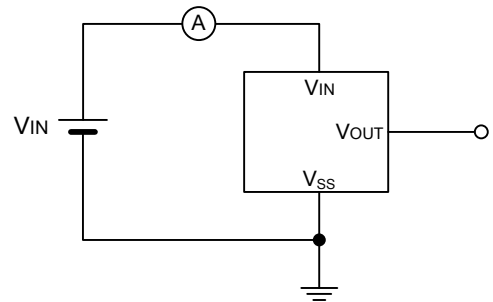
2. V_{DF(T)}: Established Detect Voltage Value

■ TEST CIRCUITS

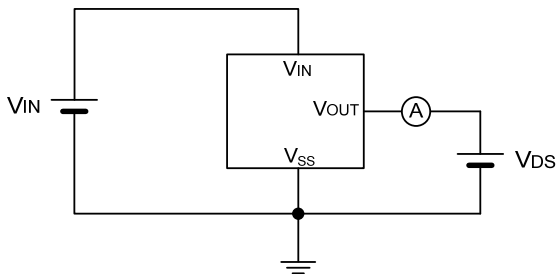
Circuit 1



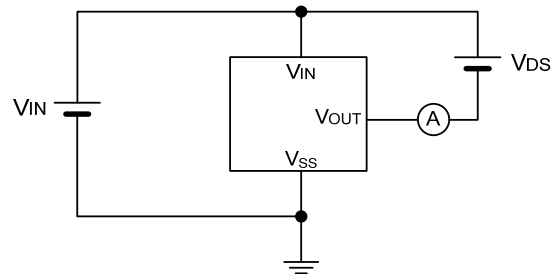
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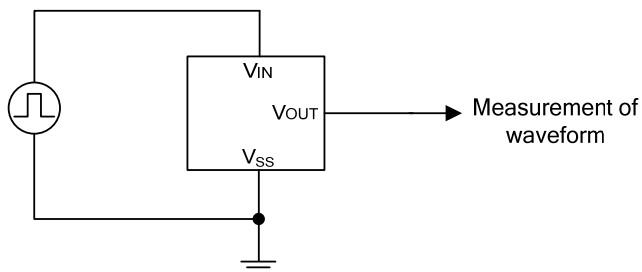
Circuit 3



Circuit 4

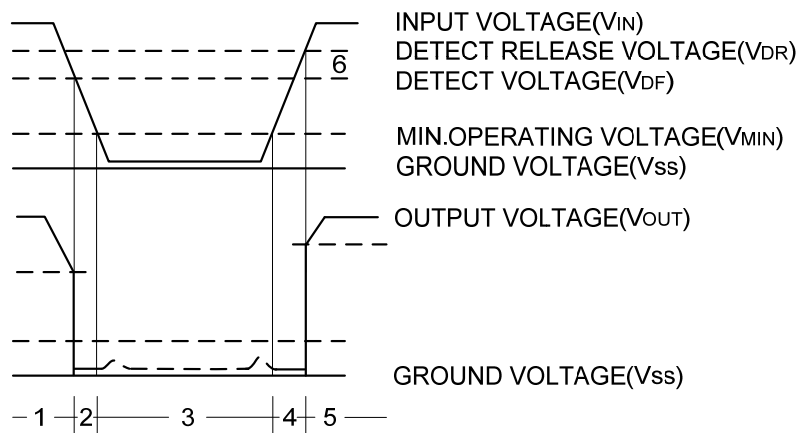


Circuit 5



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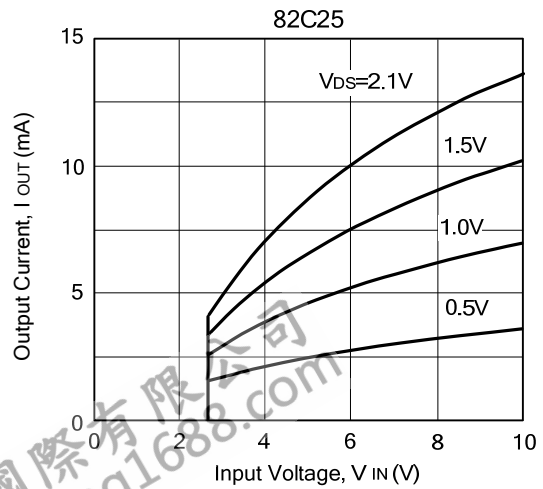
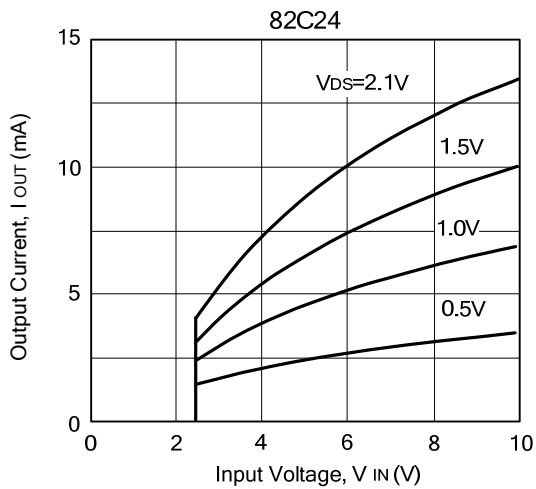
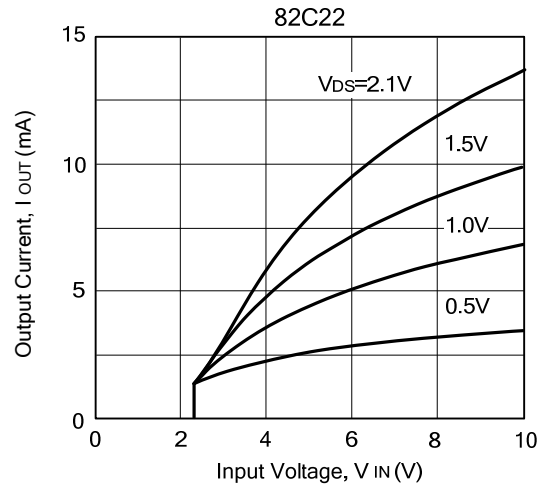
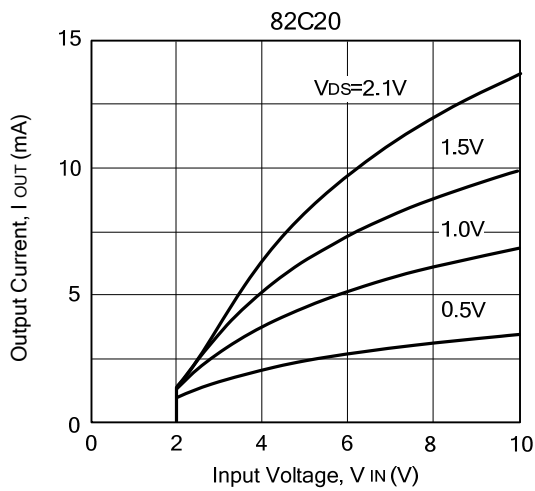
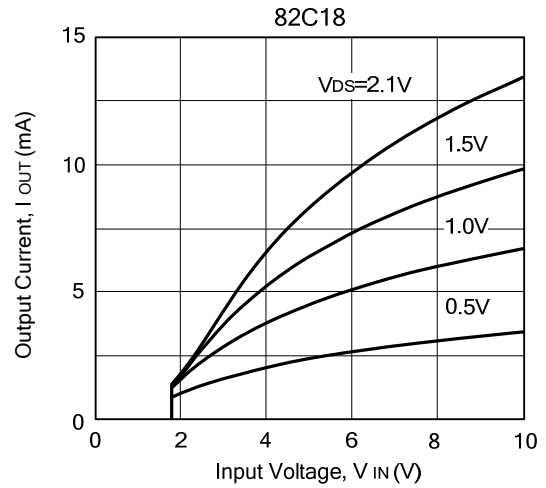
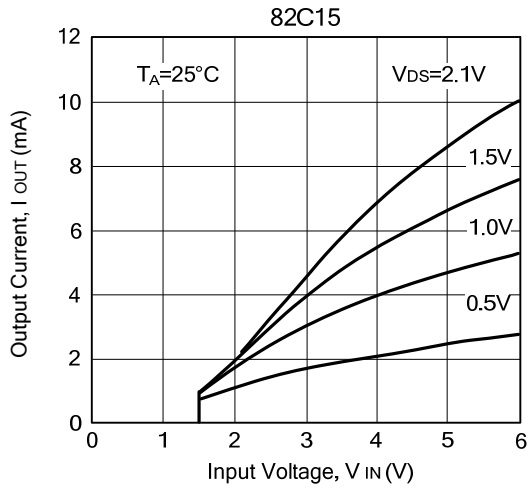
■ TIMING CHART FUNCTIONAL DESCRIPTION



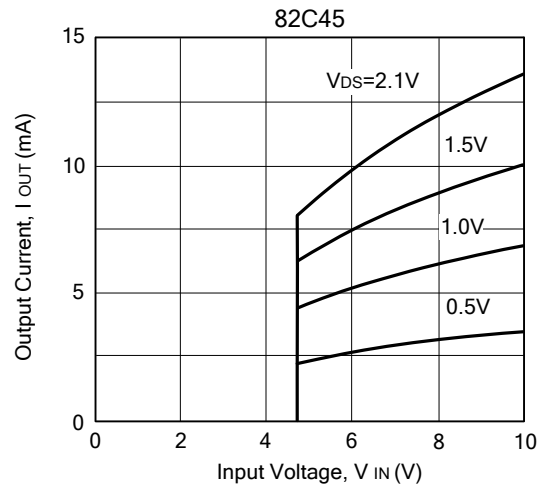
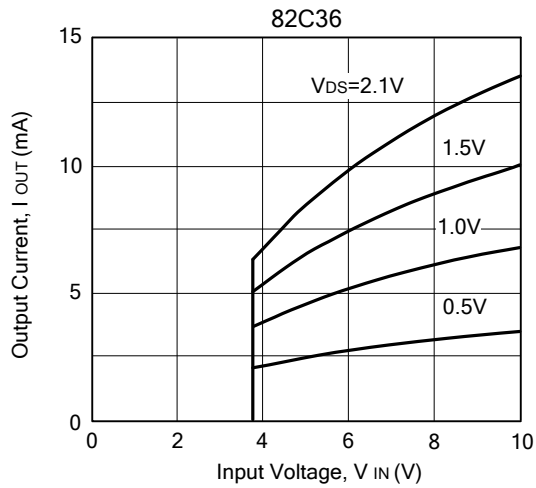
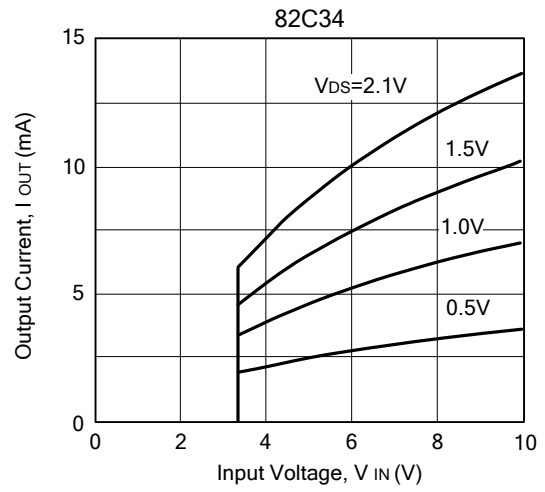
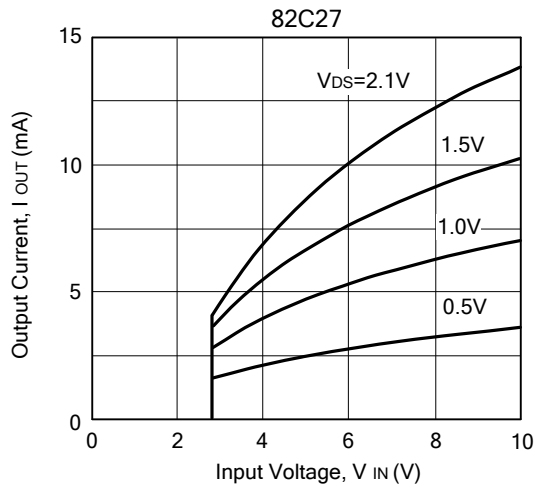
1. When input voltage (V_{IN}) rises above detect voltage (V_{DF}), output voltage (V_{OUT}) will be equal to V_{IN} .
2. When input voltage (V_{IN}) falls below detect voltage (V_{DF}), output voltage (V_{OUT}) will be equal to the ground voltage (V_{SS}) level.
3. When input voltage (V_{IN}) falls to a level below that of the minimum operating voltage (V_{MIN}), output will become unstable. In this condition, V_{IN} will equal the pulled-up output (should output be pulled-up.)
4. When input voltage (V_{IN}) rises above the ground voltage (V_{SS}) level, output will be unstable at levels below the minimum operating voltage (V_{MIN}). Between the V_{MIN} and detect release voltage (V_{DR}) levels, the ground voltage (V_{SS}) level will be maintained.
5. When input voltage (V_{IN}) rises above detect release voltage (V_{DR}), output voltage (V_{OUT}) will be equal to V_{IN} .
6. The difference between V_{DR} and V_{DF} represents the hysteresis range.

■ TYPICAL PERFORMANCE CHARACTERISTICS

(1) P-CHANNEL DRIVER OUTPUT CURRENT vs. INPUT VOLTAGE



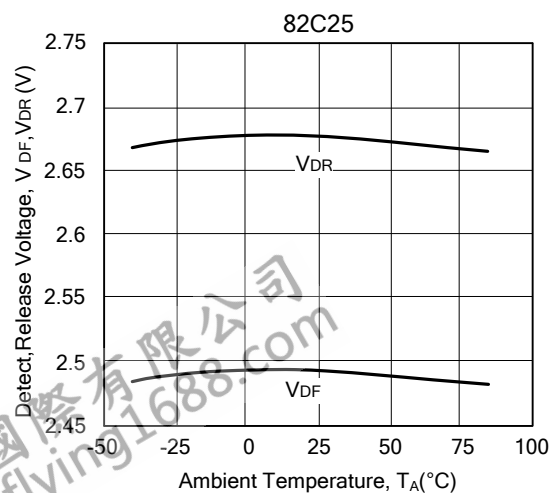
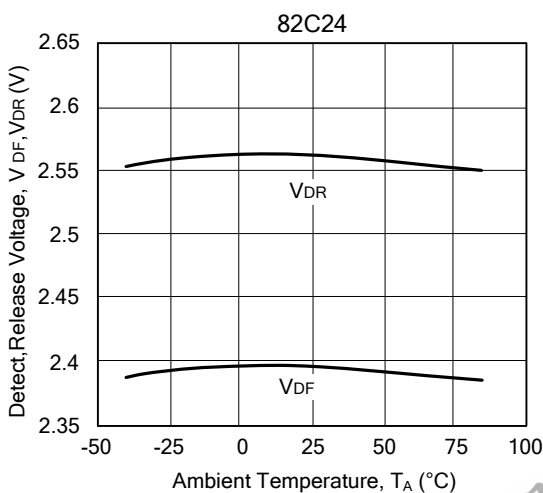
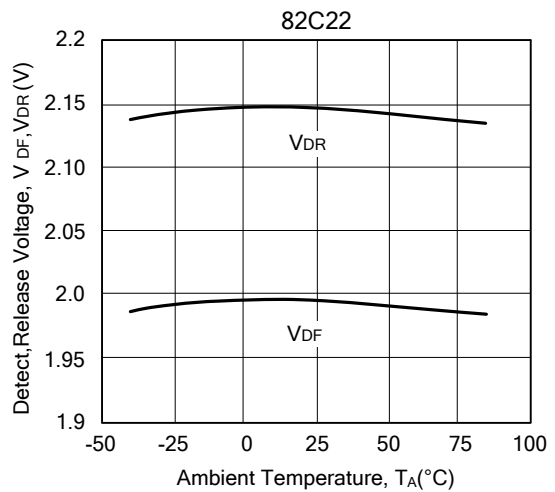
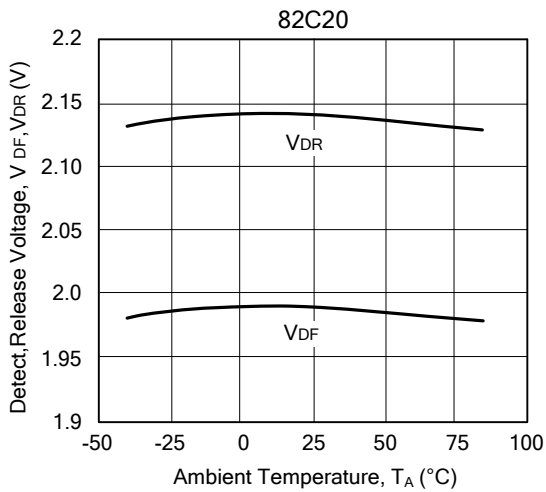
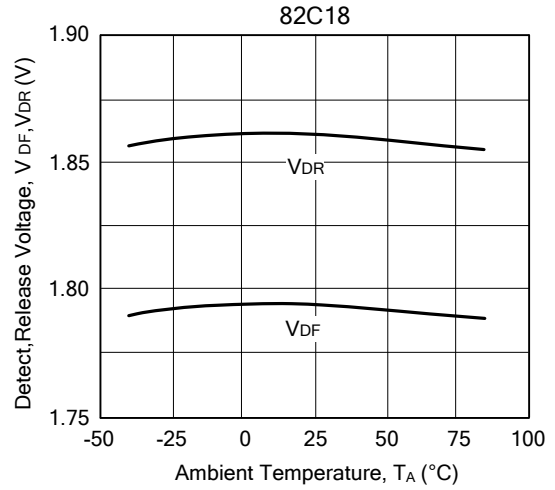
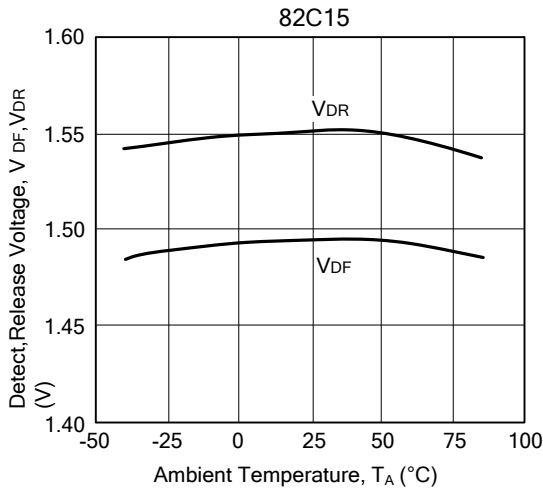
■ TYPICAL PERFORMANCE CHARACTERISTICS (Cont.)



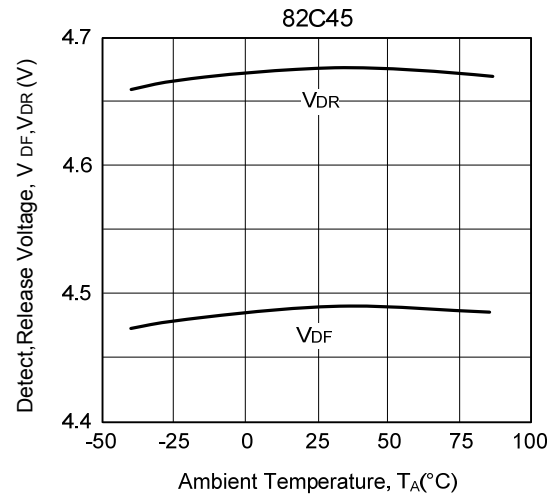
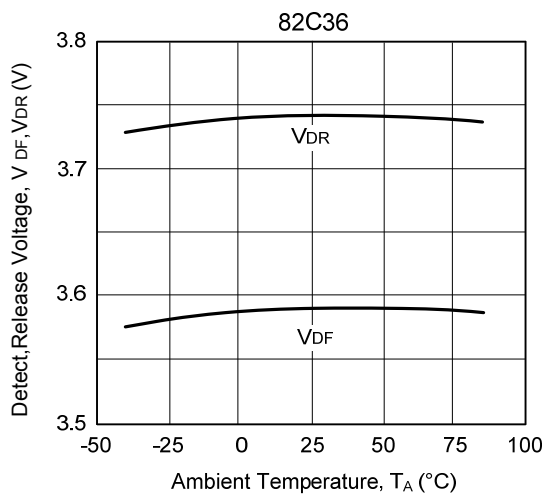
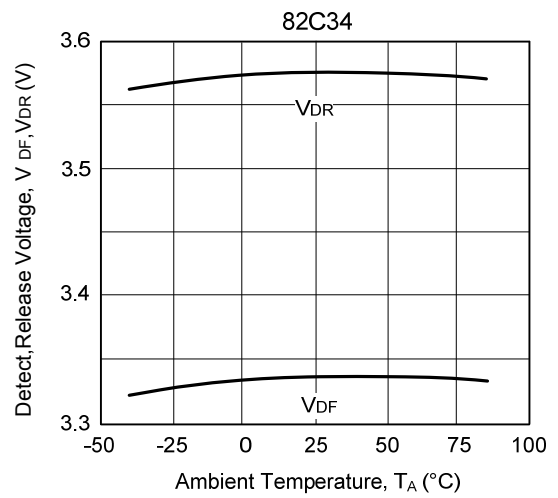
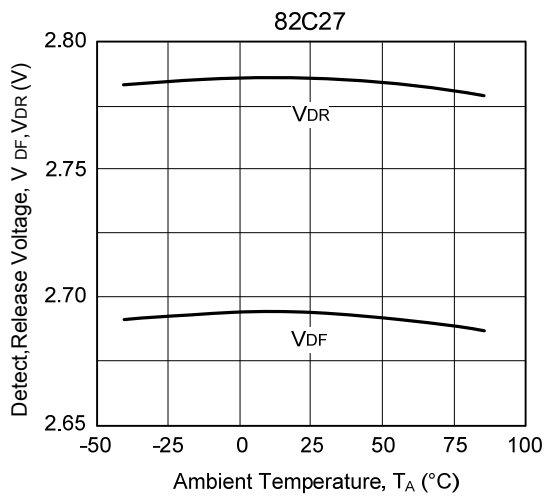
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■ TYPICAL PERFORMANCE CHARACTERICS (Cont.)

(2) DETECT, RELEASE VOLTAGE vs. AMBIENT TEMPERATURE



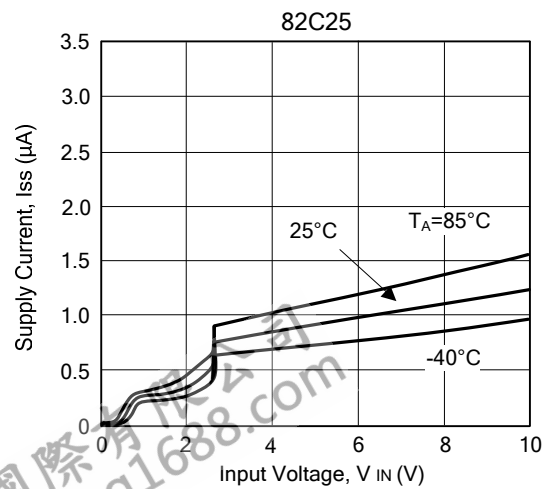
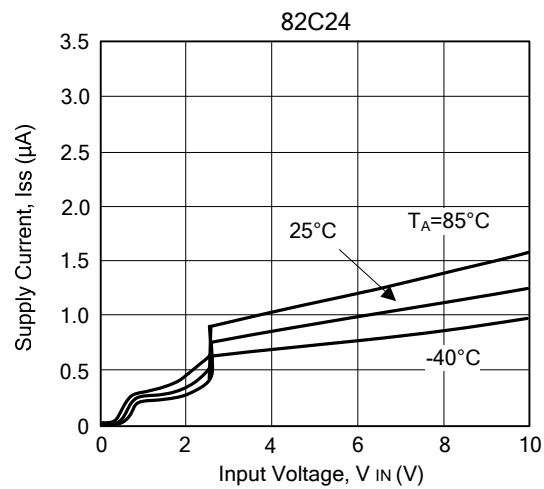
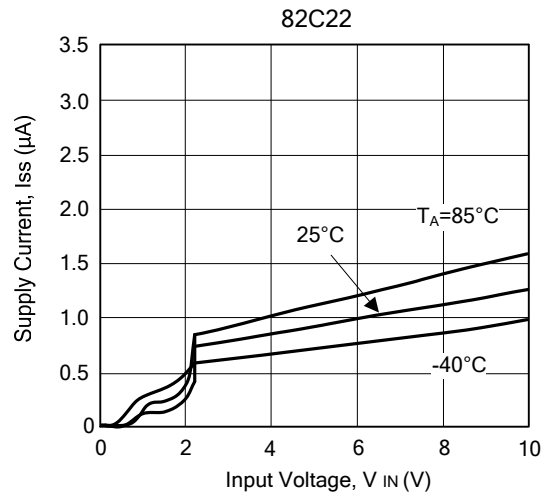
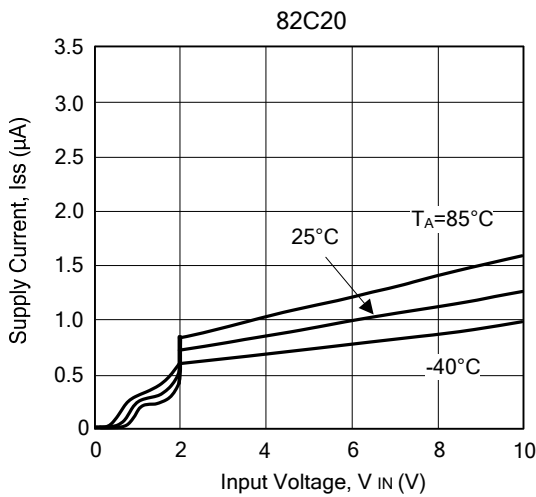
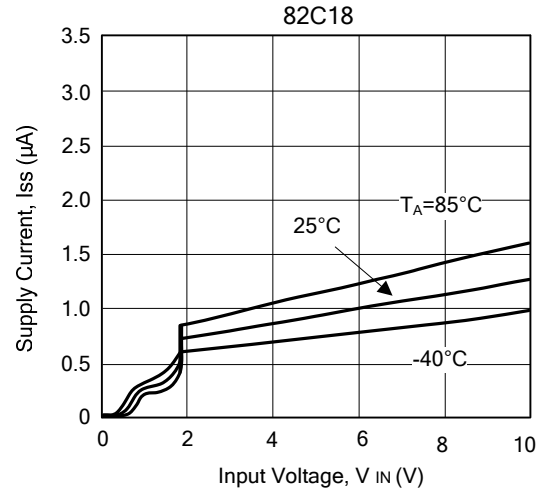
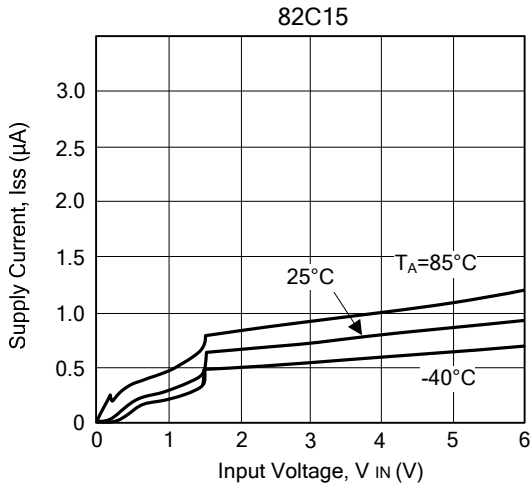
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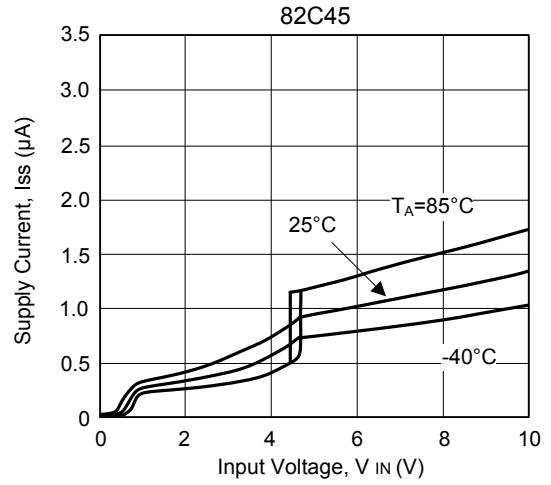
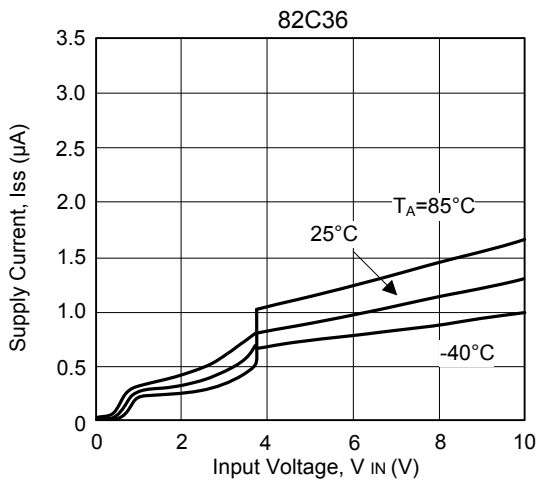
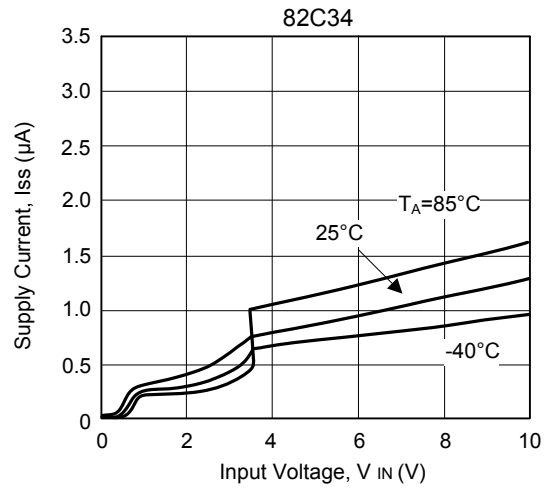
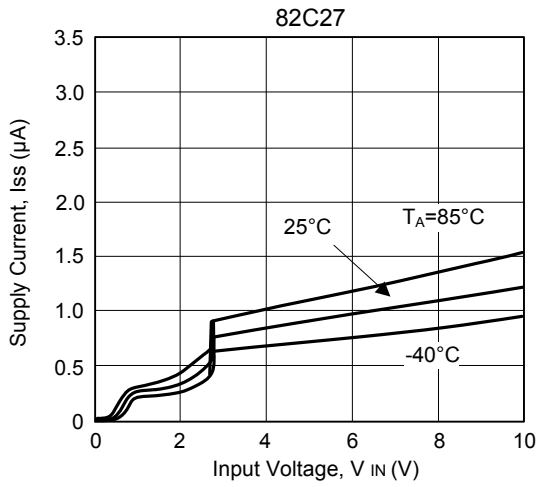
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■ TYPICAL PERFORMANCE CHARACTERICS (Cont.)

(3) SUPPLY CURRENT vs. INPUT VOLTAGE



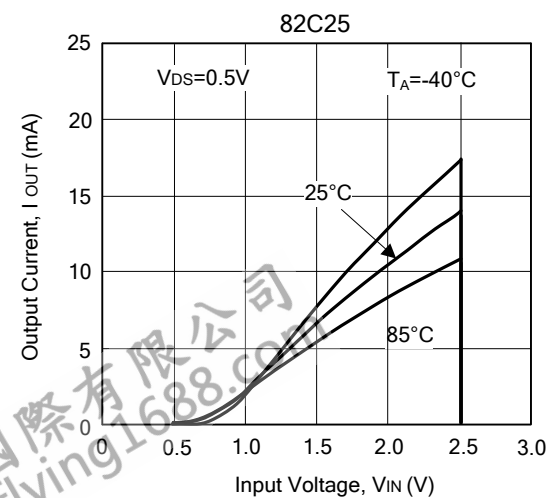
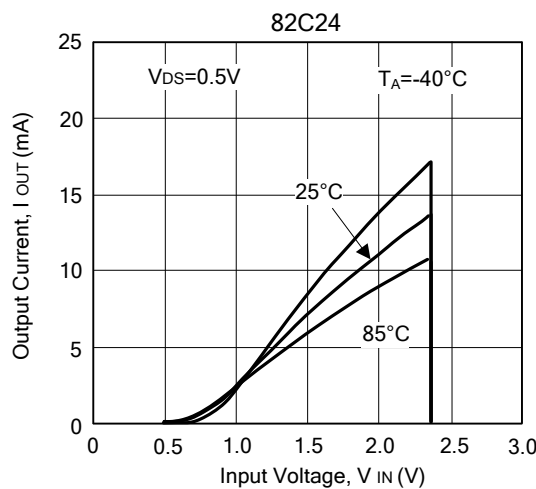
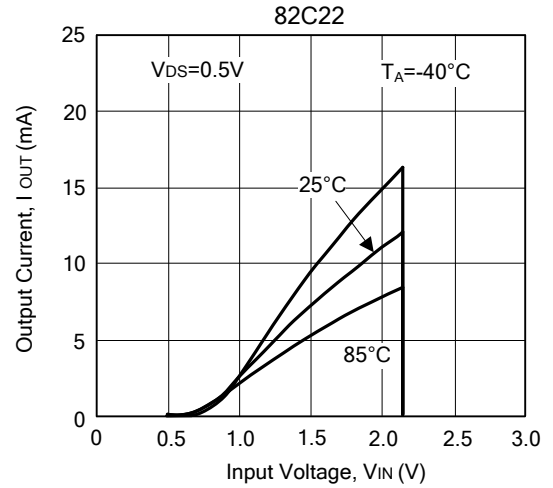
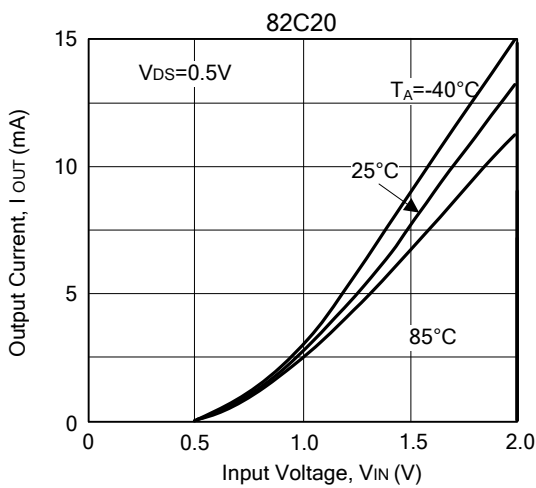
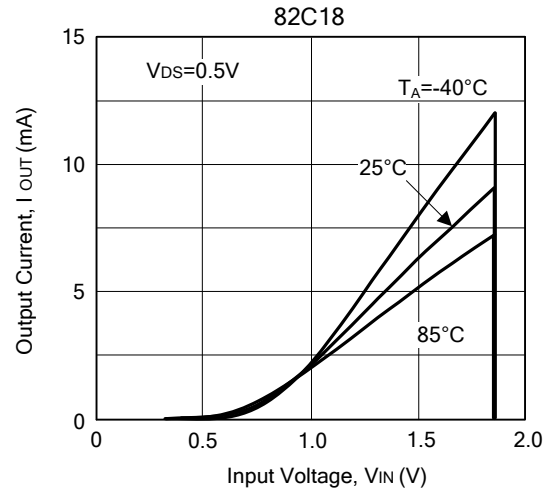
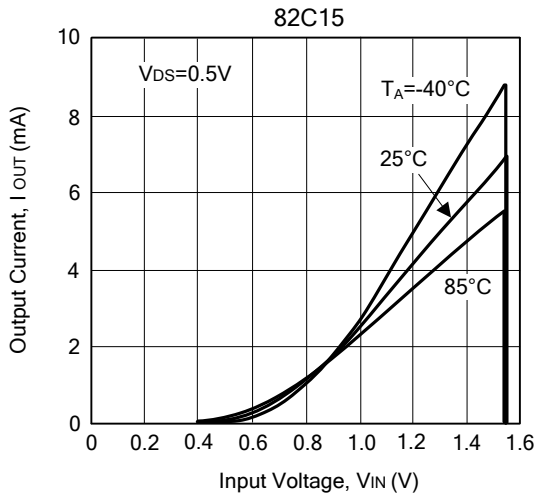
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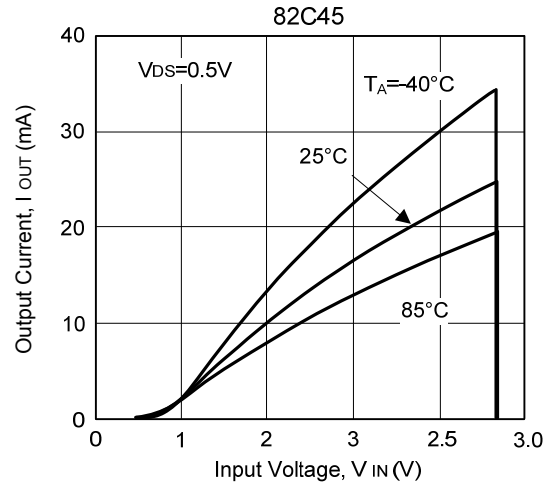
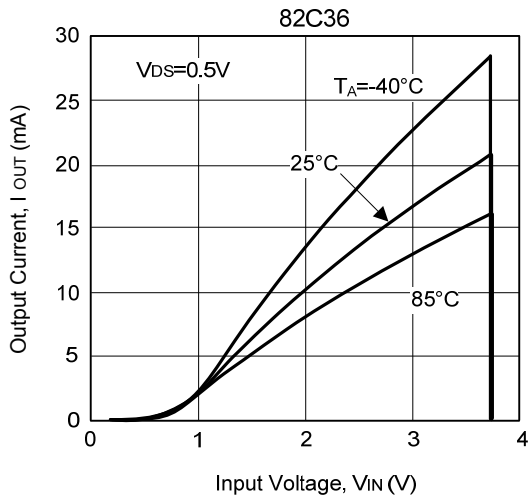
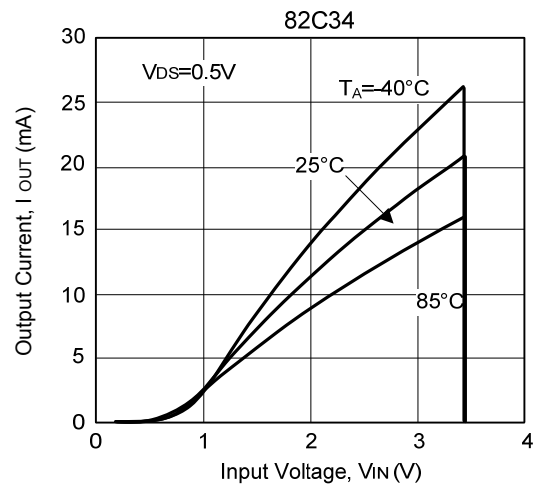
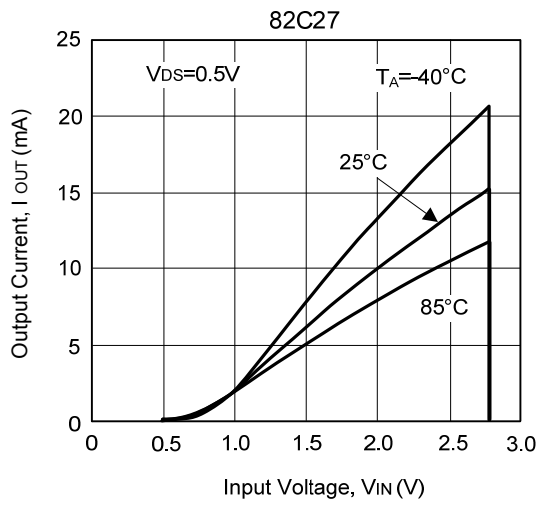
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■ TYPICAL PERFORMANCE CHARACTERISTICS (Cont.)

(4) N-CHANNEL DRIVER OUTPUT CURRENT vs. INPUT VOLTAGE



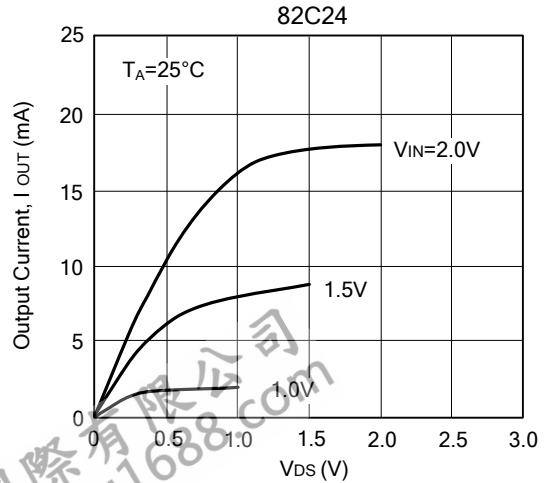
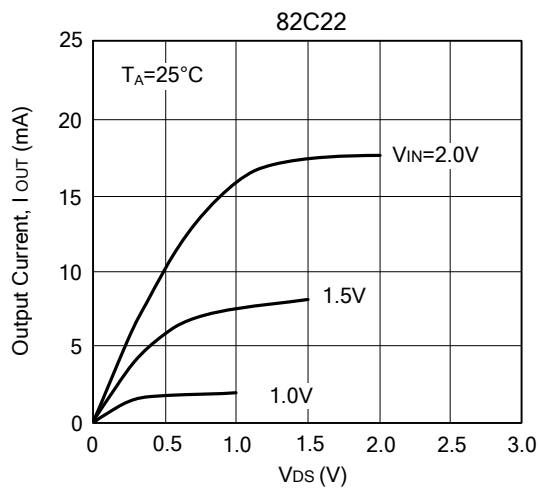
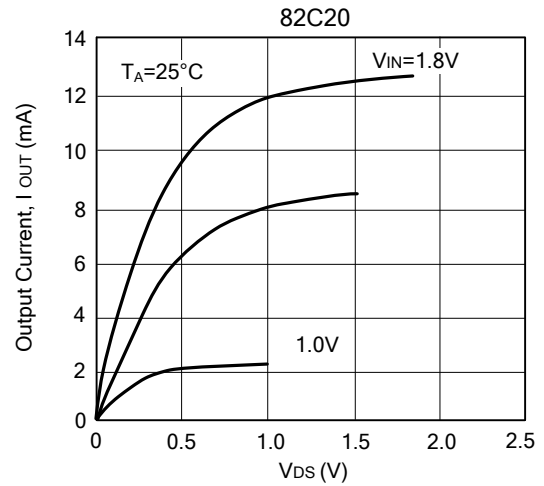
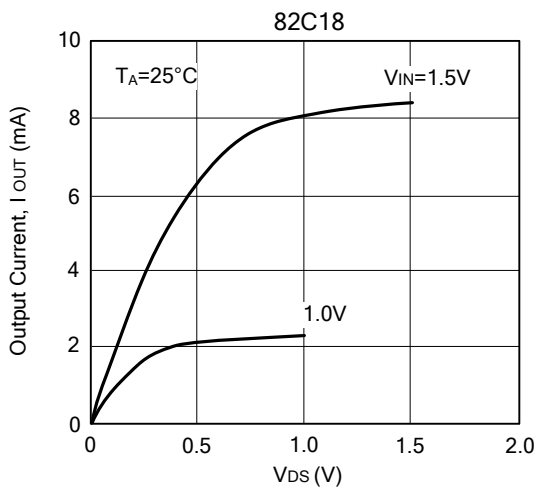
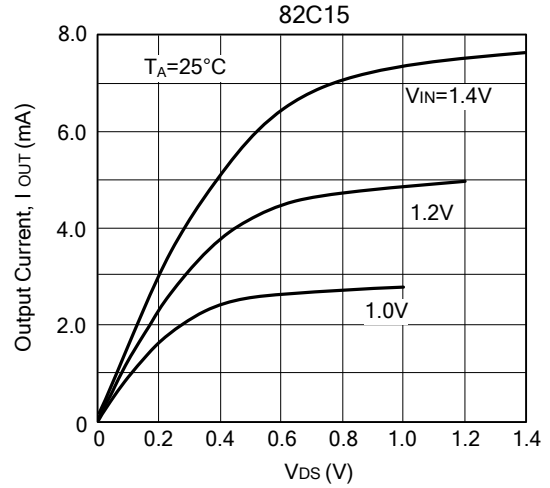
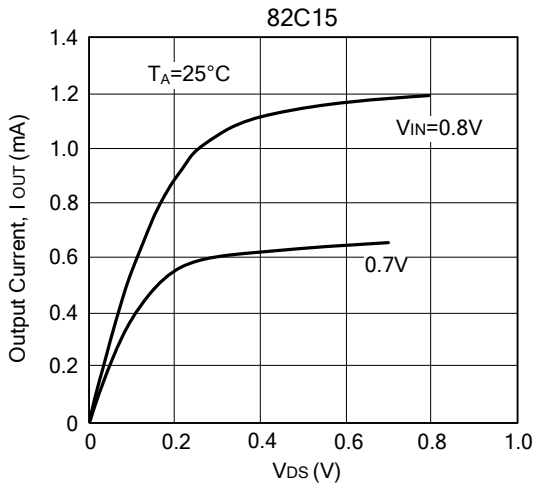
■ TYPICAL PERFORMANCE CHARACTERISTICS (Cont.)



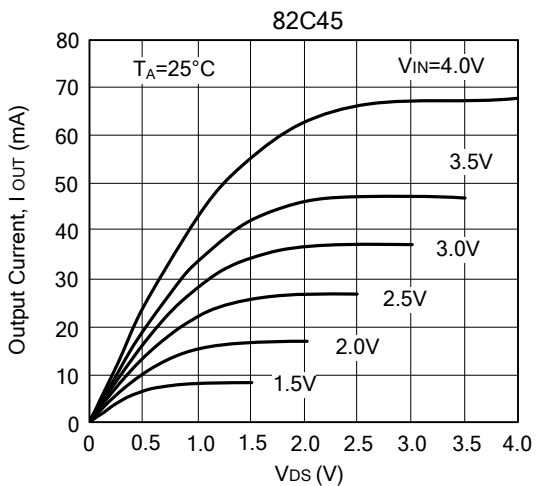
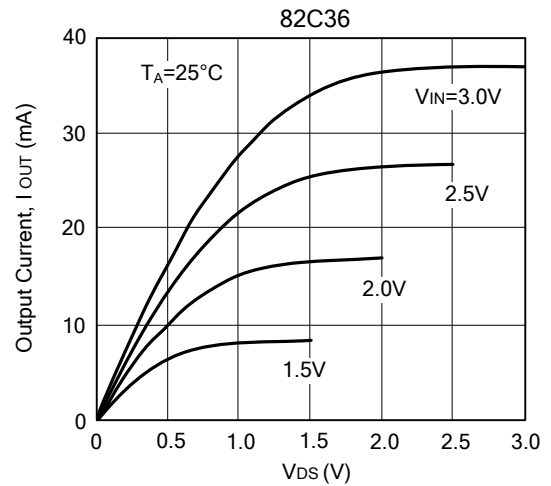
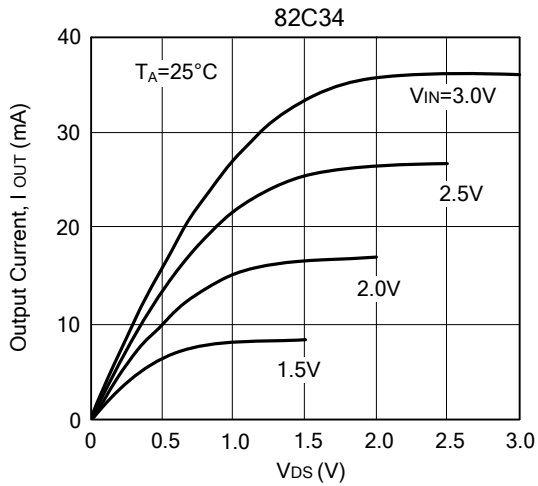
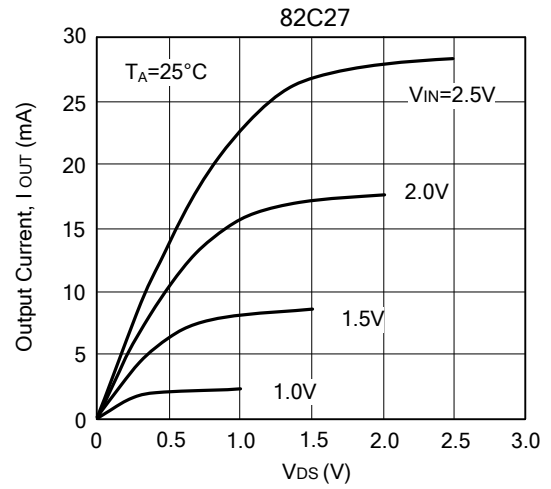
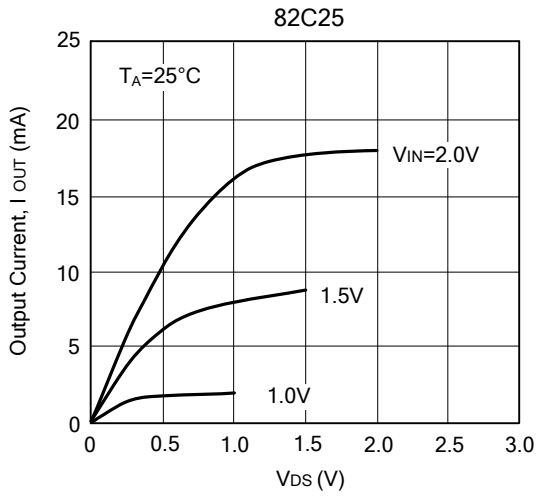
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■ TYPICAL PERFORMANCE CHARACTERISTICS (Cont.)

(5) N-CHANNEL DRIVER OUTPUT CURRENT vs. V_{DS}



■ TYPICAL PERFORMANCE CHARACTERISTICS (Cont.)



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