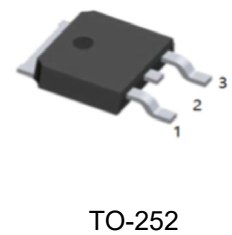
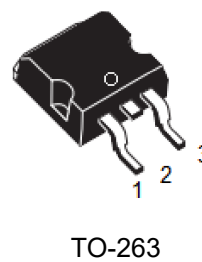
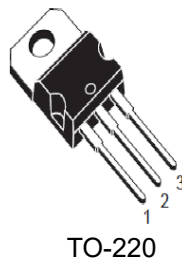


1.Features

- Three-terminal positive voltage regulator
- Output current to 1.2A
- Output voltages of 5; 6; 8; 9; 12v; 15V; 24V
- Thermal overload protection
- Short circuit protection
- Output transition soa protection

2.Pinning information

Pin	Symbol	Description
1	I	INPUT
2	G	GND
3	O	OUT



3.Absolute Maximum Ratings($T_c=25^{\circ}\text{C}$)

Parameter		Symbol	Value	Units
Input Voltage	$V_o=5$ to 18V	V_i	35	V
	$V_o=24$ V		40	V
Power Dissipation		P_D	Internally limited	
Operating Temperature Range		T_{OPR}	-40 to 125	$^{\circ}\text{C}$
Storage Temperature Range		T_{STG}	-65 to 150	$^{\circ}\text{C}$
Thermal Resistance Junction-case	TO-263	R_{thJC}	3	$^{\circ}\text{C/W}$
	TO-252		8	
	TO-220		5	
Thermal Resistance Junction-ambient	TO-263	R_{thJA}	62.5	$^{\circ}\text{C/W}$
	TO-252		100	
	TO-220		50	



4.1 Electrical Characteristics (7805)

(refer to the test circuits, $T_J = -40$ to 125°C , $V_I = 10\text{V}$, $I_O = 500\text{mA}$, $C_I = 0.33\mu\text{F}$, $C_O = 0.1\mu\text{F}$ unless otherwise specified)

Parameter	Symbol	Conditions		Min	Typ	Max	Units
Output Voltage	V_O	$T_J = 25^\circ\text{C}$		4.8	5	5.2	V
		$I_O = 5\text{mA}$ to 1A , $P_O \leq 15\text{W}$, $V_I = 8\text{V}$ to 20V		4.75	5	5.25	V
Line Regulation (Note1)	ΔV_O	$T_J = 25^\circ\text{C}$	$V_I = 7\text{V}$ to 25V			100	mV
			$V_I = 8\text{V}$ to 12V			50	mV
Load Regulation (Note1)	ΔV_O	$T_J = 25^\circ\text{C}$, $I_O = 5\text{mA}$ to 1.2A				100	mV
		$T_J = 25^\circ\text{C}$, $I_O = 250\text{mA}$ to 750mA				50	mV
Quiescent Current	I_Q	$T_J = 25^\circ\text{C}$				6	mA
Quiescent Current Change	ΔI_Q	$I_O = 5\text{mA}$ to 1A				0.5	mA
		$V_I = 8\text{V}$ to 25V				0.8	mA
Quiescent Current Change	$\Delta V_O / \Delta T$	$I_O = 5\text{mA}$			0.6		mV/ $^\circ\text{C}$
Short Circuit Current	ISC	$T_J = 25^\circ\text{C}$, $V_I = 35\text{V}$			0.75		A
Supply Voltage Rejection	SVR	$V_I = 8\text{V}$ to 18V , $f = 120\text{Hz}$, $I_O = 500\text{mA}$			68		dB



4.2 Electrical Characteristics (7806)

(refer to the test circuits, $T_J = -40$ to 125°C , $V_I = 11\text{V}$, $I_O = 500\text{mA}$, $C_I = 0.33\mu\text{F}$, $C_O = 0.1\mu\text{F}$ unless otherwise specified)

Parameter	Symbol	Conditions		Min	Typ	Max	Units
Output Voltage	V_O	$T_J = 25^\circ\text{C}$		5.75	6	6.25	V
		$I_O = 5\text{mA}$ to 1A , $P_O \leq 15\text{W}$, $V_I = 9\text{V}$ to 21V		5.7	6	6.3	V
Line Regulation (Note1)	ΔV_O	$T_J = 25^\circ\text{C}$	$V_I = 8\text{V}$ to 25V			120	mV
			$V_I = 9\text{V}$ to 13V			60	mV
Load Regulation (Note1)	ΔV_O	$T_J = 25^\circ\text{C}$, $I_O = 5\text{mA}$ to 1.2A				120	mV
		$T_J = 25^\circ\text{C}$, $I_O = 250\text{mA}$ to 750mA				60	mV
Quiescent Current	I_Q	$T_J = 25^\circ\text{C}$				6	mA
Quiescent Current Change	ΔI_Q	$I_O = 5\text{mA}$ to 1A				0.5	mA
		$V_I = 9\text{V}$ to 25V				0.8	mA
Quiescent Current Change	$\Delta V_O / \Delta T$	$I_O = 5\text{mA}$			0.7		mV/ $^\circ\text{C}$
Short Circuit Current	ISC	$T_J = 25^\circ\text{C}$, $V_I = 35\text{V}$			0.55		A
Supply Voltage Rejection	SVR	$V_I = 9\text{V}$ to 19V , $f = 120\text{Hz}$, $I_O = 500\text{mA}$			65		dB



4.3 Electrical Characteristics (7808)

(refer to the test circuits, $T_J = -40$ to 125°C , $V_I = 14\text{V}$, $I_O = 500\text{mA}$, $C_I = 0.33\mu\text{F}$, $C_O = 0.1\mu\text{F}$ unless otherwise specified)

Parameter	Symbol	Conditions		Min	Typ	Max	Units
Output Voltage	V_O	$T_J = 25^\circ\text{C}$		7.7	8	8.3	V
		$I_O = 5\text{mA}$ to 1A , $P_O \leq 15\text{W}$, $V_I = 11.5\text{V}$ to 23V		7.6	8	8.4	V
Line Regulation (Note1)	ΔV_O	$T_J = 25^\circ\text{C}$	$V_I = 10.5\text{V}$ to 25V			100	mV
			$V_I = 11\text{V}$ to 17V			80	mV
Load Regulation (Note1)	ΔV_O	$T_J = 25^\circ\text{C}$, $I_O = 5\text{mA}$ to 1.2A				160	mV
		$T_J = 25^\circ\text{C}$, $I_O = 250\text{mA}$ to 750mA				80	mV
Quiescent Current	I_Q	$T_J = 25^\circ\text{C}$				6	mA
Quiescent Current Change	ΔI_Q	$I_O = 5\text{mA}$ to 1A				0.5	mA
		$V_I = 11.5\text{V}$ to 25V				1	mA
Quiescent Current Change	$\Delta V_O / \Delta T$	$I_O = 5\text{mA}$			1		mV/ $^\circ\text{C}$
Short Circuit Current	ISC	$T_J = 25^\circ\text{C}$, $V_I = 35\text{V}$			0.45		A
Supply Voltage Rejection	SVR	$V_I = 11.5\text{V}$ to 21.5V , $f = 120\text{Hz}$, $I_O = 500\text{mA}$			62		dB



4.4 Electrical Characteristics (7809)

(refer to the test circuits, $T_J = -40$ to 125°C , $V_I = 15\text{V}$, $I_O = 500\text{mA}$, $C_I = 0.33\mu\text{F}$, $C_O = 0.1\mu\text{F}$ unless otherwise specified)

Parameter	Symbol	Conditions		Min	Typ	Max	Units
Output Voltage	V_O	$T_J = 25^\circ\text{C}$		8.64	9	9.36	V
		$I_O = 5\text{mA}$ to 1A , $P_O \leq 15\text{W}$, $V_I = 11.5\text{V}$ to 26V		8.55	9	9.45	V
Line Regulation (Note1)	ΔV_O	$T_J = 25^\circ\text{C}$	$V_I = 11.5\text{V}$ to 26V			180	mV
			$V_I = 12\text{V}$ to 18V			90	mV
Load Regulation (Note1)	ΔV_O	$T_J = 25^\circ\text{C}$, $I_O = 5\text{mA}$ to 1.2A				180	mV
		$T_J = 25^\circ\text{C}$, $I_O = 250\text{mA}$ to 750mA				90	mV
Quiescent Current	I_Q	$T_J = 25^\circ\text{C}$				6	mA
Quiescent Current Change	ΔI_Q	$I_O = 5\text{mA}$ to 1A				0.5	mA
		$V_I = 11.5\text{V}$ to 26V				1	mA
Quiescent Current Change	$\Delta V_O / \Delta T$	$I_O = 5\text{mA}$			1		mV/ $^\circ\text{C}$
Short Circuit Current	ISC	$T_J = 25^\circ\text{C}$, $V_I = 35\text{V}$			0.4		A
Supply Voltage Rejection	SVR	$V_I = 11.5\text{V}$ to 21.5V , $f = 120\text{Hz}$, $I_O = 500\text{mA}$			61		dB



4.5 Electrical Characteristics (7812)

(refer to the test circuits, $T_J = -40$ to 125°C , $V_I = 19\text{V}$, $I_O = 500\text{mA}$, $C_I = 0.33\mu\text{F}$, $C_O = 0.1\mu\text{F}$ unless otherwise specified)

Parameter	Symbol	Conditions		Min	Typ	Max	Units
Output Voltage	V_O	$T_J = 25^\circ\text{C}$		11.5	12	12.5	V
		$I_O = 5\text{mA}$ to 1A , $P_O \leq 15\text{W}$, $V_I = 15.5\text{V}$ to 27V		11.4	12	12.6	V
Line Regulation (Note1)	ΔV_O	$T_J = 25^\circ\text{C}$	$V_I = 14.5\text{V}$ to 30V			240	mV
			$V_I = 16\text{V}$ to 22V			120	mV
Load Regulation (Note1)	ΔV_O	$T_J = 25^\circ\text{C}$, $I_O = 5\text{mA}$ to 1.2A				240	mV
		$T_J = 25^\circ\text{C}$, $I_O = 250\text{mA}$ to 750mA				120	mV
Quiescent Current	I_Q	$T_J = 25^\circ\text{C}$				6	mA
Quiescent Current Change	ΔI_Q	$I_O = 5\text{mA}$ to 1A				0.5	mA
		$V_I = 15\text{V}$ to 30V				1	mA
Quiescent Current Change	$\Delta V_O / \Delta T$	$I_O = 5\text{mA}$			1.5		mV/ $^\circ\text{C}$
Short Circuit Current	ISC	$T_J = 25^\circ\text{C}$, $V_I = 35\text{V}$			0.35		A
Supply Voltage Rejection	SVR	$V_I = 15\text{V}$ to 25V , $f = 120\text{Hz}$, $I_O = 500\text{mA}$			60		dB



4.6 Electrical Characteristics (7815)

(refer to the test circuits, $T_J = -40$ to 125°C , $V_I = 19\text{V}$, $I_O = 500\text{mA}$, $C_I = 0.33\mu\text{F}$, $C_O = 0.1\mu\text{F}$ unless otherwise specified)

Parameter	Symbol	Conditions		Min	Typ	Max	Units
Output Voltage	V_O	$T_J = 25^\circ\text{C}$		14.4	15	15.6	V
		$I_O = 5\text{mA}$ to 1A , $P_O \leq 15\text{W}$, $V_I = 17.5\text{V}$ to 27V		14.25	15	15.75	V
Line Regulation (Note1)	ΔV_O	$T_J = 25^\circ\text{C}$	$V_I = 17.5\text{V}$ to 30V			300	mV
			$V_I = 18\text{V}$ to 22V			150	mV
Load Regulation (Note1)	ΔV_O	$T_J = 25^\circ\text{C}$, $I_O = 5\text{mA}$ to 1.2A				100	mV
		$T_J = 25^\circ\text{C}$, $I_O = 250\text{mA}$ to 750mA				150	mV
Quiescent Current	I_Q	$T_J = 25^\circ\text{C}$				6	mA
Quiescent Current Change	ΔI_Q	$I_O = 5\text{mA}$ to 1A				0.5	mA
		$V_I = 17\text{V}$ to 30V				1	mA
Quiescent Current Change	$\Delta V_O / \Delta T$	$I_O = 5\text{mA}$			1.5		mV/ $^\circ\text{C}$
Short Circuit Current	ISC	$T_J = 25^\circ\text{C}$, $V_I = 35\text{V}$			0.23		A
Supply Voltage Rejection	SVR	$V_I = 18.5\text{V}$ to 28.5V , $f = 120\text{Hz}$, $I_O = 500\text{mA}$			58		dB



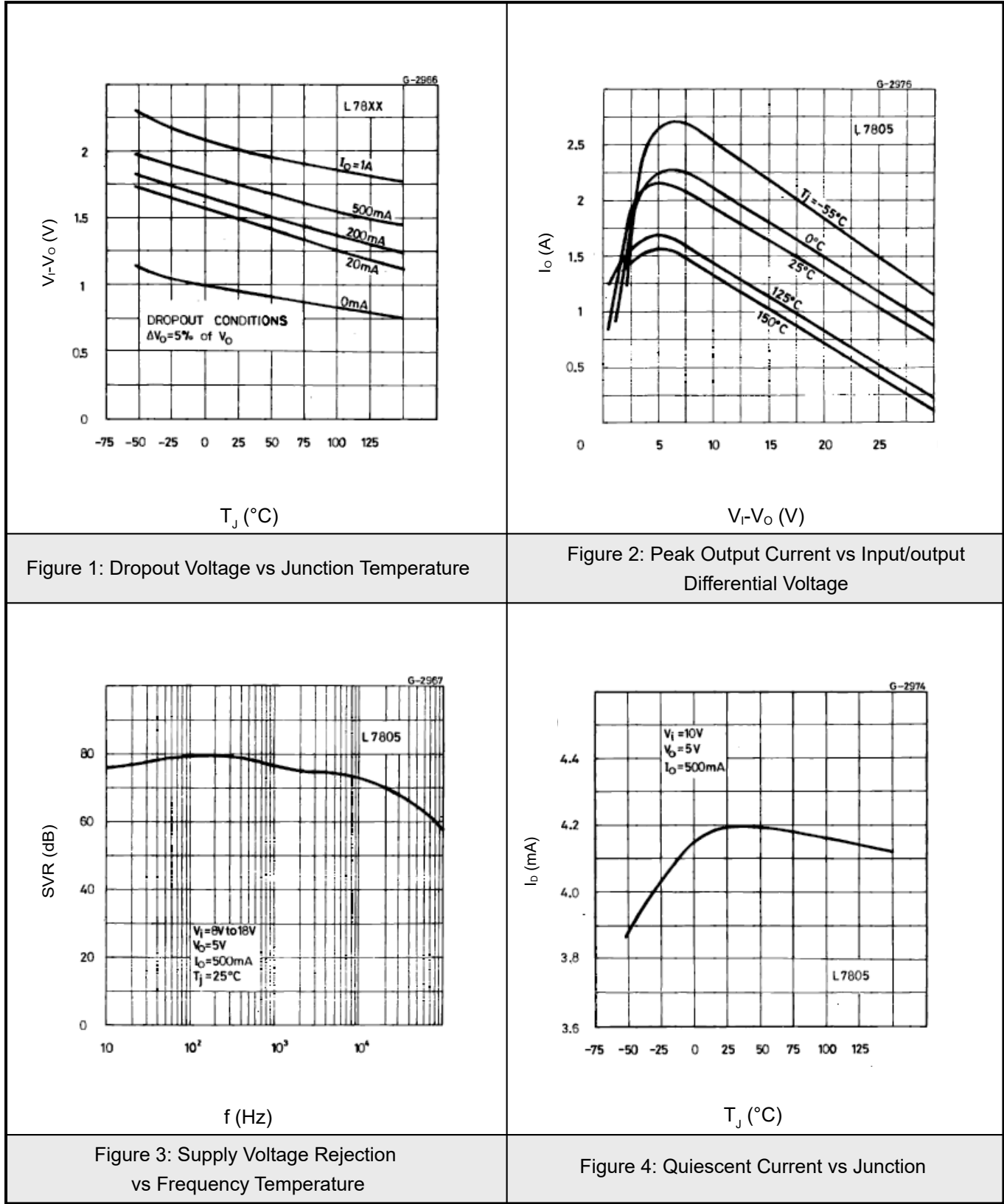
4.7 Electrical Characteristics (7824)

(refer to the test circuits, $T_J = -40$ to 125°C , $V_I = 28\text{V}$, $I_O = 500\text{mA}$, $C_I = 0.33\mu\text{F}$, $C_O = 0.1\mu\text{F}$ unless otherwise specified)

Parameter	Symbol	Conditions		Min	Typ	Max	Units
Output Voltage	V_O	$T_J = 25^\circ\text{C}$		23.04	24	24.96	V
		$I_O = 5\text{mA}$ to 1A , $P_O \leq 15\text{W}$, $V_I = 27\text{V}$ to 35V		22.80	24	25.2	V
Line Regulation (Note1)	ΔV_O	$T_J = 25^\circ\text{C}$	$V_I = 27\text{V}$ to 35V			300	mV
			$V_I = 28\text{V}$ to 30V			150	mV
Load Regulation (Note1)	ΔV_O	$T_J = 25^\circ\text{C}$, $I_O = 5\text{mA}$ to 1.2A				100	mV
		$T_J = 25^\circ\text{C}$, $I_O = 250\text{mA}$ to 750mA				150	mV
Quiescent Current	I_Q	$T_J = 25^\circ\text{C}$				6	mA
Quiescent Current Change	ΔI_Q	$I_O = 5\text{mA}$ to 1A				0.5	mA
		$V_I = 15\text{V}$ to 35V				1	mA
Quiescent Current Change	$\Delta V_O / \Delta T$	$I_O = 5\text{mA}$			1.5		mV/ $^\circ\text{C}$
Short Circuit Current	ISC	$T_J = 25^\circ\text{C}$, $V_I = 40\text{V}$			0.23		A
Supply Voltage Rejection	SVR	$V_I = 28\text{V}$ to 38V , $f = 120\text{Hz}$, $I_O = 500\text{mA}$			54		dB



5.1 Typical characteristic





5.2 Typical characteristic

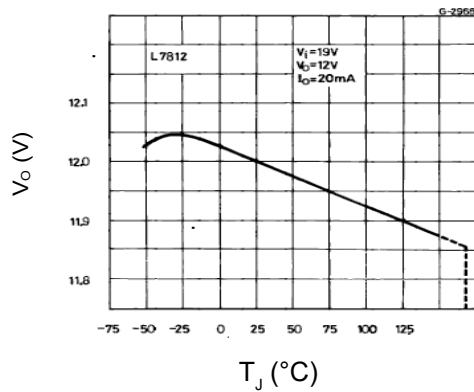


Figure 5: Output Voltage vs Junction Temperature

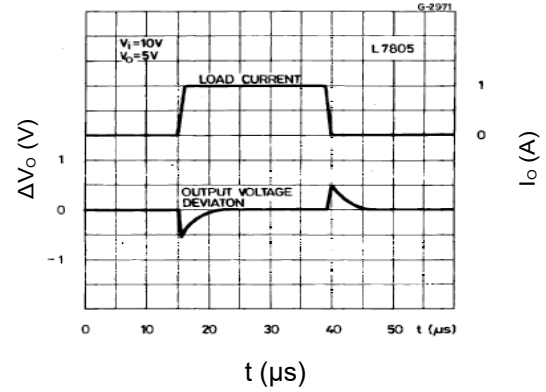


Figure 6: Load Transient Response

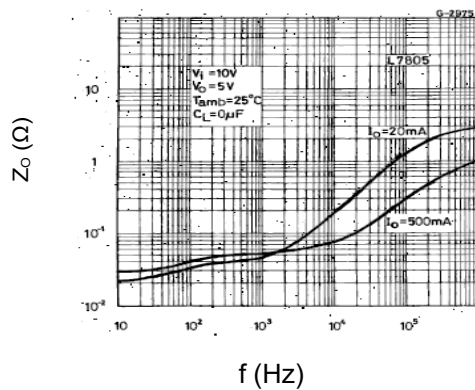


Figure 7: Output Impedance vs Frequency

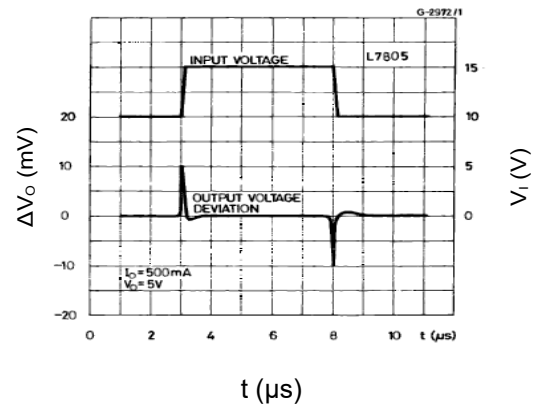


Figure 8: Line Transient Response

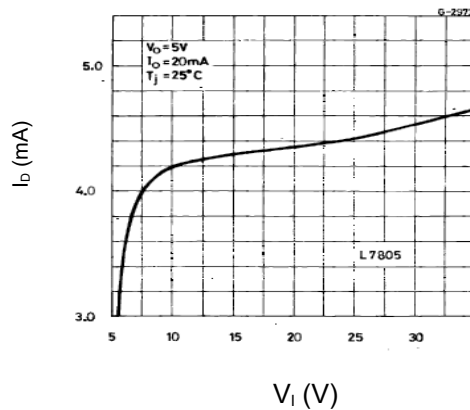
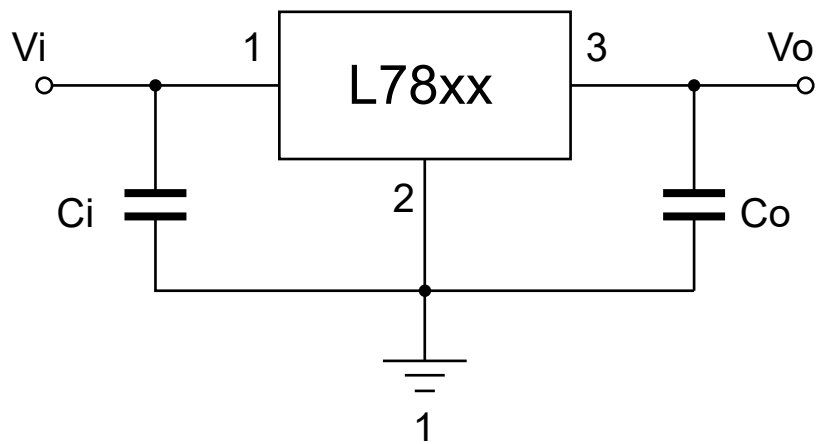


Figure 9: Quiescent Current vs Input Voltage

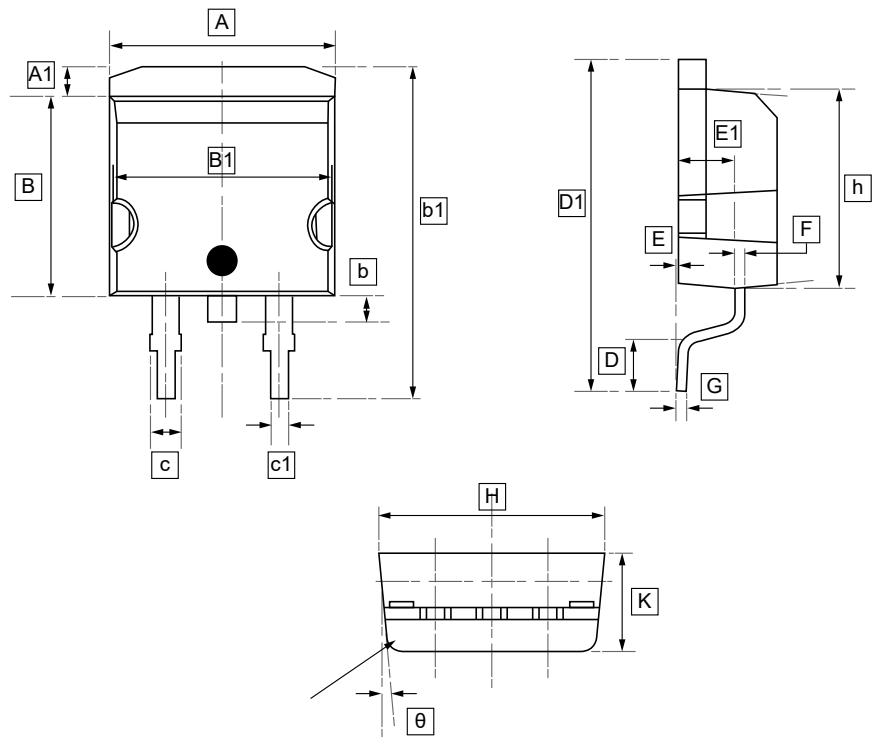


6. Typical Application





7.1 TO-263-3 Package Outline Dimensions



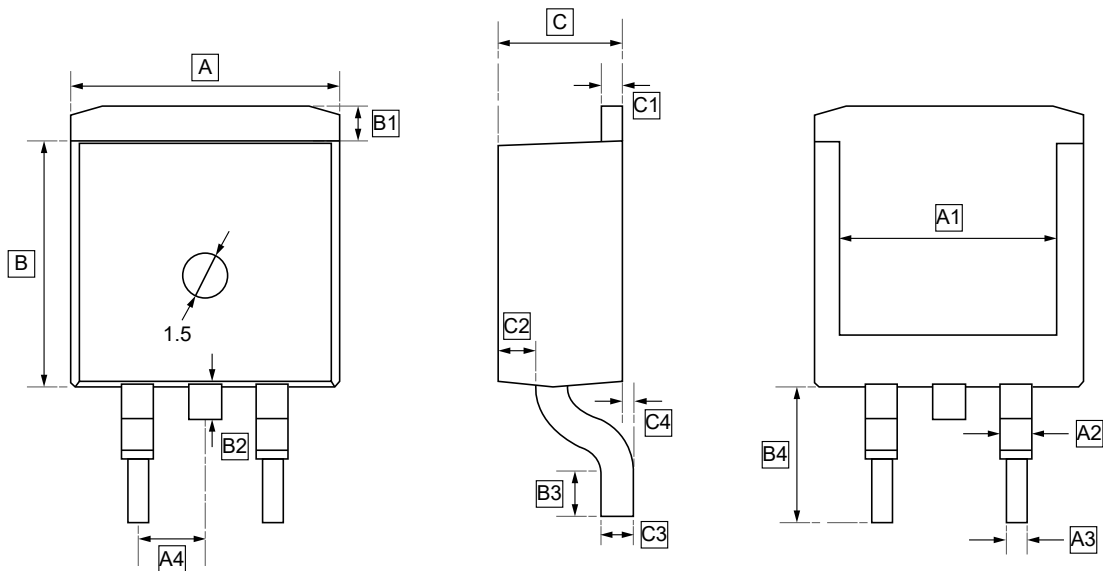
DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	B	B1	c	c1	D	D1	E	E1	F	G
Min	10.2	1.35	9.05	10.0	1.27	0.8	2.5	15.2	0.0	2.6	0.45	0.25
Max			8.95		3X		2.1	14.8	0.2	2.5		

Symbol	h	H	K	θ
Min	9.05	10.15	4.5	5°
Max	8.95	10.05	4.4	



7.2 TO-263-3 Package Outline Dimensions

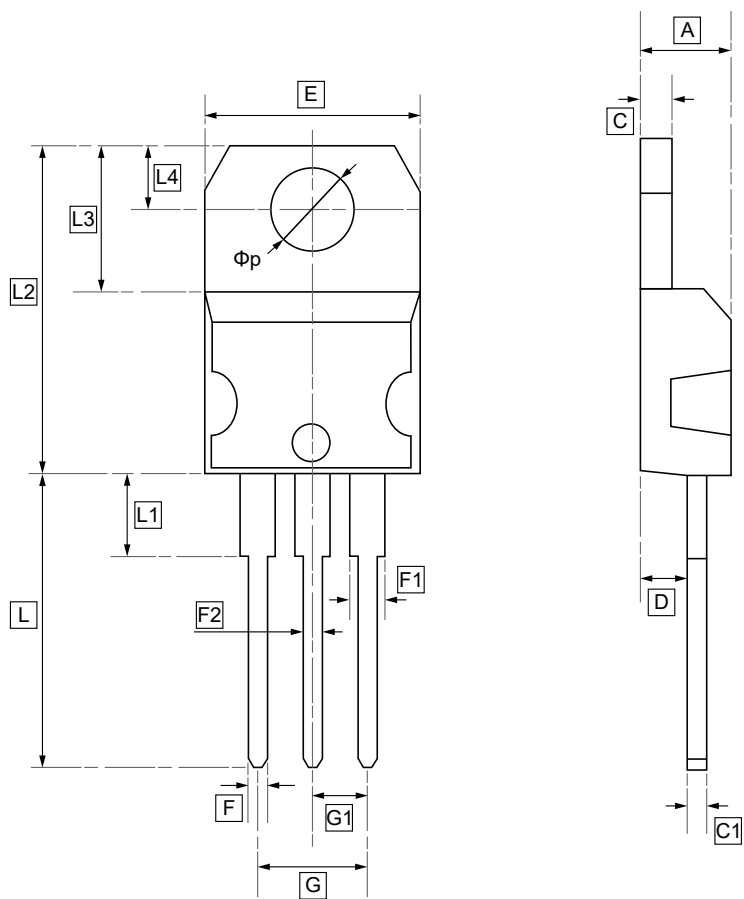


DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	A3	A4	B	B1	B2	B3	B4	C	C1	C2	C3	C4
Min	9.78	7.02	1.22	0.77	2.5	8.7	1.07	1.4	2.0	5.03	4.42	1.27	1.55	0.48	0.01
Max	9.98	7.3	1.35	0.83	2.58	9.7	1.47	1.7	2.6	5.23	4.58	1.33	1.65	0.52	0.12



7.3 TO-220 Package Outline Dimensions



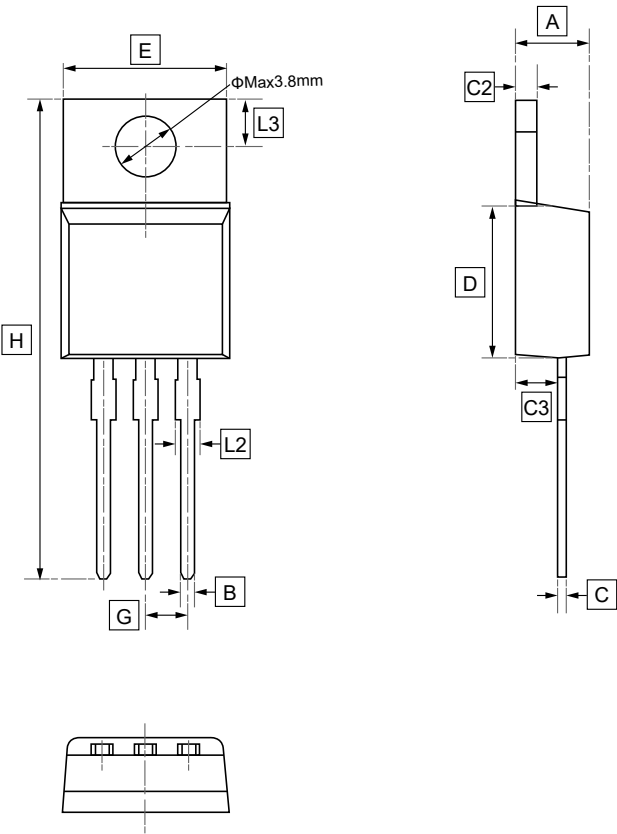
DIMENSIONS (mm are the original dimensions)

Symbol	A	C	C1	D	E	F	F1	F2	G	G1	L	L1
Min	4.4	1.2	0.38	2.4	9.85	0.6	1.22	1.22	4.93	2.39	13.1	3.75
Max	4.6	1.32	0.55	2.65	10.85	0.85	1.4	1.4	5.23	2.69	13.9	4.75

Symbol	L2	L3	L4	Φp
Min	15.25	6.25	2.65	3.75
Max	15.75	6.75	2.85	3.95



7.4 TO-220 Package Outline Dimensions

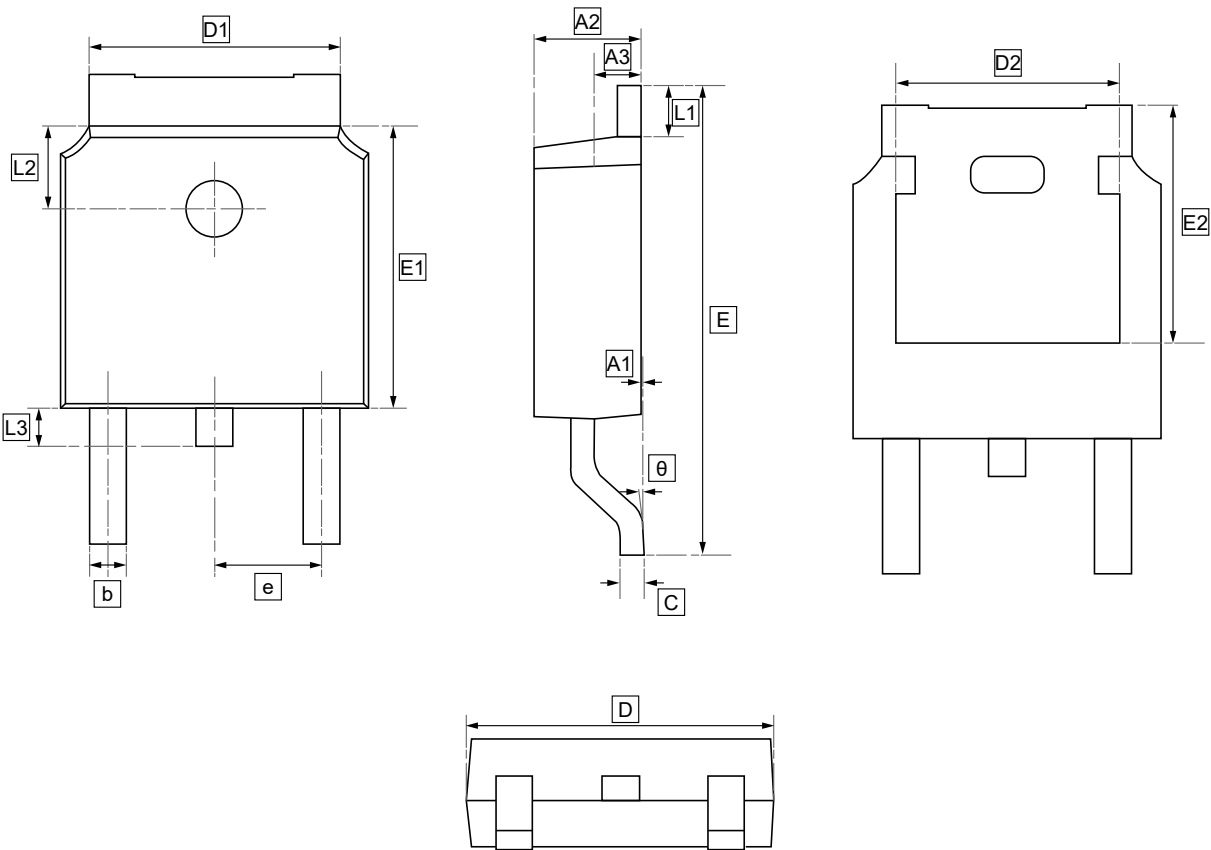


DIMENSIONS (mm are the original dimensions)

Symbol	A	B	C	C2	C3	D	E	G	H	L2	L3
Min	4.30	0.60	0.28	1.17	2.30	8.80	9.80	2.44	28.55	1.10	2.59
Max	4.70	1.00	0.48	1.37	2.70	9.20	10.20	2.64	29.15	1.50	2.89



7.5 TO-252 Package Outline Dimensions

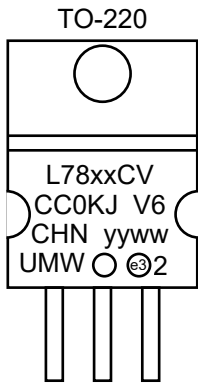
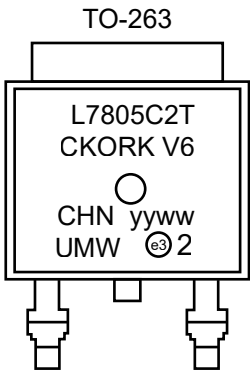
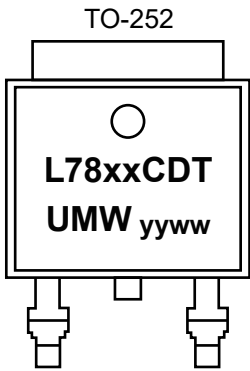


DIMENSIONS (mm are the original dimensions)

Symbol	A1	A2	A3	b	c	D	D1	D2	E	E1	E2	e	L1	L2	L3	θ
Min	0.00	2.18	0.90	0.65	0.46	6.35	4.95	4.32	9.40	5.97	5.21	2.286 BSC	0.89	1.70	0.60	0.00
Max	0.13	2.39	1.10	0.85	0.61	6.73	5.46	4.90	10.41	6.22	5.38		1.27	1.90	1.00	8.00



8.Ordering Information



yy: Year Code
ww: Week Code

Order Code	Marking	Package	Base QTY	Delivery Mode
UMW L78xxCDT	L78xxCDT	TO-252	2500	Tape and reel
UMW L78xxCD2T	L78xxC2T	TO-263	1000	Tape and reel
UMW L78xxCV	L78xxCV	TO-220	1000	Tube and box



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