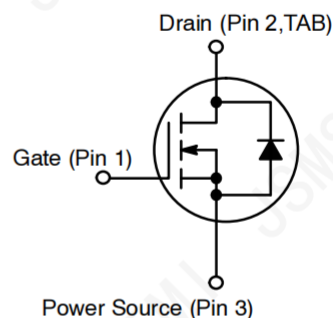
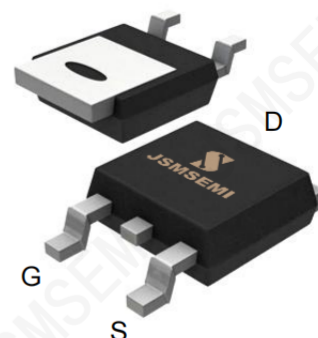


Description

The family is monolithic fixed voltage regulator integrated circuit. They are suitable for applications that required supply current up to 0.5 A.

Applications

- Peak output current up to 0.5A.
- Fixed output voltage of 5V, 6V,7V,8V, 9V, 10V, 12V, 15V and 18V available.
- Thermal overload shutdown protection.
- Short circuit current limiting.
- Output transistor SOA protection.



Absolute Maximum Ratings_(T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V _{IN}	35	V
Output Current	I _{OUT}	0.5	A
Power Dissipation (T _C =25°C)	P _D	10	W
Junction Temperature	T _J	+150	°C
Operating Temperature	T _{OPR}	-40 ~ +85	°C
Storage Temperature	T _{STG}	-55 ~ +150	°C

Notes: 1. Absolute maximum ratings are stress ratings only and functional device operation is not implied. The device could be damaged beyond Absolute maximum ratings.

2. The maximum steady state usable output current are dependent on input voltage, heat sinking, lead length of the package and copper pattern of PCB. The data are showed as electrical characteristics table represents pulse test conditions with junction temperatures specified at the initiation of test.

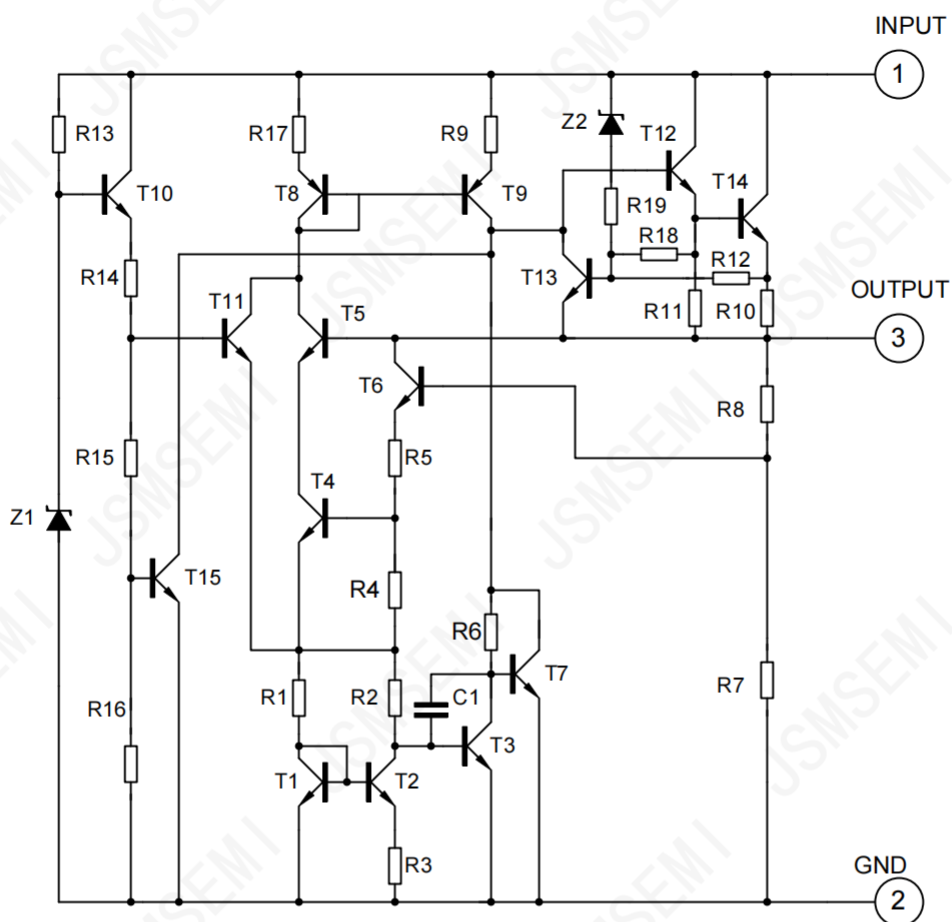
Thermal Data

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ _{JA}	112	°C/W
Junction to Case	θ _{JC}	12.5	°C/W

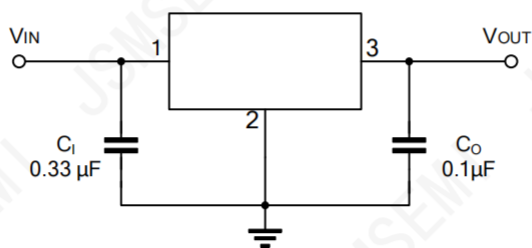
Ordering Information

Order number	Package	Marking	Operation Temperature Range	MSL Grade	Ship, Quantity	Green
MC7805BDTRKG	TO-252	78M05	-55 to 150°C	3	T&R,2500	Rohs

Block Diagram



Application Circuit



Note: Bypass capacitors are recommended for optimum stability and transient response and should be located as close as possible to the regulators.

Electrical Characteristics

($T_J=25^{\circ}\text{C}$, $C_I=0.33\mu\text{F}$, $C_O=0.1\mu\text{F}$, $P_D\leq 15\text{W}$, unless otherwise specified)

For 78D05AA ($V_{IN}=10\text{V}$, $I_{OUT}=0.5\text{A}$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$I_{OUT}=5\text{mA}\sim 1.0\text{A}$	4.80	5.0	5.20	V
		$V_{IN}=7.5\sim 20\text{V}$, $I_{OUT}=5\text{mA}\sim 1.0\text{A}$	4.75		5.25	V
Load Regulation	ΔV_{OUT}	$I_{OUT}=5\text{mA}\sim 1.5\text{A}$			50	mV
		$I_{OUT}=0.25\text{A}\sim 0.75\text{A}$			25	mV
Line Regulation	ΔV_{OUT}	$V_{IN}=7\sim 25\text{V}$			50	mV
		$V_{IN}=7.5\sim 20\text{V}$, $I_{OUT}=1.0\text{A}$			50	mV
Quiescent Current	I_Q	$I_{OUT}\leq 1.0\text{A}$			8.0	mA
Quiescent Current Change	ΔI_Q	$V_{IN}=7.5\sim 20\text{V}$			1.0	mA
		$I_{OUT}=5\text{mA}\sim 1.0\text{A}$			0.5	mA
Output Noise Voltage	eN	$10\text{Hz}\leq f\leq 100\text{kHz}$		40		μV
Temperature coefficient of V_{OUT}	$\Delta V_{OUT}/\Delta T$	$I_{OUT}=5\text{mA}$		-0.6		$\text{mV}/^{\circ}\text{C}$
Ripple Rejection	RR	$V_{IN}=8\sim 18\text{V}$, $f=120\text{Hz}$	62	80		dB
Peak Output Current	I_{PEAK}			0.5		A
Short-Circuit Current	I_{SC}	$V_{IN}=35\text{V}$		250		mA
Dropout Voltage	V_D			2.0		V

For 78D06AA ($V_{IN}=11\text{V}$, $I_{OUT}=0.5\text{A}$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$I_{OUT}=5\text{mA}\sim 1.0\text{A}$	5.76	6.0	6.24	V
		$V_{IN}=8.5\sim 21\text{V}$, $I_{OUT}=5\text{mA}\sim 1.0\text{A}$	5.7		6.3	V
Load Regulation	ΔV_{OUT}	$I_{OUT}=5\text{mA}\sim 1.5\text{A}$			60	mV
		$I_{OUT}=0.25\text{A}\sim 0.75\text{A}$			30	mV
Line Regulation	ΔV_{OUT}	$V_{IN}=8\sim 25\text{V}$			60	mV
		$V_{IN}=8.5\sim 21\text{V}$, $I_{OUT}=1.0\text{A}$			60	mV
Quiescent Current	I_Q	$I_{OUT}\leq 1.0\text{A}$			8.0	mA
Quiescent Current Change	ΔI_Q	$V_{IN}=8.5\sim 21\text{V}$			1.0	mA
		$I_{OUT}=5\text{mA}\sim 1.0\text{A}$			0.5	mA
Output Noise Voltage	eN	$10\text{Hz}\leq f\leq 100\text{kHz}$		45		μV
Temperature coefficient of V_{OUT}	$\Delta V_{OUT}/\Delta T$	$I_{OUT}=5\text{mA}$		-0.7		$\text{mV}/^{\circ}\text{C}$
Ripple Rejection	RR	$V_{IN}=9\sim 19\text{V}$, $f=120\text{Hz}$	59	75		dB
Peak Output Current	I_{PEAK}			0.5		A
Short-Circuit Current	I_{SC}	$V_{IN}=35\text{V}$		250		mA
Dropout Voltage	V_D			2.0		V

For 78D07AA ($V_{IN}=13\text{V}$, $I_{OUT}=0.5\text{A}$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$I_{OUT}=5\text{mA}\sim 1.0\text{A}$	6.72	7.0	7.28	V
		$V_{IN}=9.5\sim 22\text{V}$, $I_{OUT}=5\text{mA}\sim 1.0\text{A}$	6.65		7.35	V
Load Regulation	ΔV_{OUT}	$I_{OUT}=5\text{mA}\sim 1.5\text{A}$			70	mV
		$I_{OUT}=0.25\text{A}\sim 0.75\text{A}$			35	mV
Line Regulation	ΔV_{OUT}	$V_{IN}=9\sim 25\text{V}$			70	mV
		$V_{IN}=9.5\sim 22\text{V}$, $I_{OUT}=1.0\text{A}$			70	mV
Quiescent Current	I_Q	$I_{OUT}\leq 1.0\text{A}$			8.0	mA
Quiescent Current Change	ΔI_Q	$V_{IN}=9.5\sim 22\text{V}$			1.0	mA
		$I_{OUT}=5\text{mA}\sim 1.0\text{A}$			0.5	mA
Output Noise Voltage	eN	$10\text{Hz}\leq f\leq 100\text{kHz}$		50		μV
Temperature coefficient of V_{OUT}	$\Delta V_{OUT}/\Delta T$	$I_{OUT}=5\text{mA}$		-0.8		$\text{mV}/^{\circ}\text{C}$
Ripple Rejection	RR	$V_{IN}=10\sim 20\text{V}$, $f=120\text{Hz}$	59	75		dB
Peak Output Current	I_{PEAK}			1.7		A
Short-Circuit Current	I_{SC}	$V_{IN}=35\text{V}$		250		mA
Dropout Voltage	V_D			2.0		V

Electrical Characteristics (Cont.)
For 78D08AA ($V_{IN}=14V$, $I_{OUT}=0.5A$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$I_{OUT}=5mA\sim1.0A$	7.68	8.0	8.32	V
		$V_{IN}=10.5\sim23V$, $I_{OUT}=5mA\sim1.0A$	7.6		8.4	V
Load Regulation	ΔV_{OUT}	$I_{OUT}=5mA\sim1.5A$			80	mV
		$I_{OUT}=0.25A\sim0.75A$			40	mV
Line Regulation	ΔV_{OUT}	$V_{IN}=10.5\sim25V$			80	mV
		$V_{IN}=10.5\sim23V$, $I_{OUT}=1.0A$			80	mV
Quiescent Current	I_Q	$I_{OUT}\leq1.0A$			8.0	mA
Quiescent Current Change	ΔI_Q	$V_{IN}=10.5\sim23V$			1.0	mA
		$I_{OUT}=5mA\sim1.0A$			0.5	mA
Output Noise Voltage	eN	$10Hz\leq f\leq 100kHz$		58		μV
Temperature coefficient of V_{OUT}	$\Delta V_{OUT}/\Delta T$	$I_{OUT}=5mA$		-0.9		mV/ $^{\circ}C$
Ripple Rejection	RR	$V_{IN}=11.5\sim21.5V$, $f=120Hz$	56	72		dB
Peak Output Current	I_{PEAK}			0.5		A
Short-Circuit Current	I_{SC}	$V_{IN}=35V$		250		mA
Dropout Voltage	V_D					V

For 78D09AA ($V_{IN}=15V$, $I_{OUT}=0.5A$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$I_{OUT}=5mA\sim1.0A$	8.64	9.0	9.36	V
		$V_{IN}=11.5\sim24V$, $I_{OUT}=5mA\sim1.0A$	8.55		9.45	V
Load Regulation	ΔV_{OUT}	$I_{OUT}=5mA\sim1.5A$			90	mV
		$I_{OUT}=0.25A\sim0.75A$			45	mV
Line Regulation	ΔV_{OUT}	$V_{IN}=11.5\sim25V$			90	mV
		$V_{IN}=11.5\sim24V$, $I_{OUT}=1.0A$			90	mV
Quiescent Current	I_Q	$I_{OUT}\leq1.0A$			8.0	mA
Quiescent Current Change	ΔI_Q	$V_{IN}=11.5\sim24V$			1.0	mA
		$I_{OUT}=5mA\sim1.0A$			0.5	mA
Output Noise Voltage	eN	$10Hz\leq f\leq 100kHz$		58		μV
Temperature coefficient of V_{OUT}	$\Delta V_{OUT}/\Delta T$	$I_{OUT}=5mA$		-1.1		mV/ $^{\circ}C$
Ripple Rejection	RR	$V_{IN}=12.5\sim22.5V$, $f=120Hz$	56	72		dB
Peak Output Current	I_{PEAK}			0.5		A
Short-Circuit Current	I_{SC}	$V_{IN}=35V$		250		mA
Dropout Voltage	V_D			2.0		V

For 78D10AA ($V_{IN}=16V$, $I_{OUT}=0.5A$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$I_{OUT}=5mA\sim1.0A$	9.60	10.0	10.40	V
		$V_{IN}=12.5\sim25V$, $I_{OUT}=5mA\sim1.0A$	9.5		10.5	V
Load Regulation	ΔV_{OUT}	$I_{OUT}=5mA\sim1.5A$			100	mV
		$I_{OUT}=0.25A\sim0.75A$			50	mV
Line Regulation	ΔV_{OUT}	$V_{IN}=13\sim25V$			100	mV
		$V_{IN}=13\sim25V$, $I_{OUT}=1.0A$			100	mV
Quiescent Current	I_Q	$I_{OUT}\leq1.0A$			8.0	mA
Quiescent Current Change	ΔI_Q	$V_{IN}=12.6V\sim25V$			1.0	mA
		$I_{OUT}=5mA\sim1.0A$			0.5	mA
Output Noise Voltage	eN	$10Hz\leq f\leq 100kHz$		58		μV
Temperature coefficient of V_{OUT}	$\Delta V_{OUT}/\Delta T$	$I_{OUT}=5mA$		-1.1		mV/ $^{\circ}C$
Ripple Rejection	RR	$V_{IN}=13\sim23V$, $f=120Hz$	56	72		dB
Peak Output Current	I_{PEAK}			0.5		A
Short-Circuit Current	I_{SC}	$V_{IN}=35V$		250		mA
Dropout Voltage	V_D			2.0		V

Electrical Characteristics (Cont.)

For 78D12AA ($V_{IN}=19V$, $I_{OUT}=0.5A$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$I_{OUT}=5mA\sim1.0A$	11.52	12.0	12.48	V
		$V_{IN}=14.5\sim27V$, $I_{OUT}=5mA\sim1.0A$	11.4		12.6	V
Load Regulation	ΔV_{OUT}	$I_{OUT}=5mA\sim1.5A$			120	mV
		$I_{OUT}=0.25A\sim0.75A$			60	mV
Line Regulation	ΔV_{OUT}	$V_{IN}=14.5\sim30V$			120	mV
		$V_{IN}=14.6\sim27V$, $I_{OUT}=1.0A$			120	mV
Quiescent Current	I_Q	$I_{OUT}\leq1.0A$			8.0	mA
Quiescent Current Change	ΔI_Q	$V_{IN}=14.5\sim30V$			1.0	mA
		$I_{OUT}=5mA\sim1.0A$			0.5	mA
Output Noise Voltage	eN	$10Hz\leq f\leq 100kHz$		75		μV
Temperature coefficient of V_{OUT}	$\Delta V_{OUT}/\Delta T$	$I_{OUT}=5mA$		-1.5		mV/°C
Ripple Rejection	RR	$V_{IN}=15\sim25V$, $f=120Hz$	55	72		dB
Peak Output Current	I_{PEAK}			0.5		A
Short-Circuit Current	I_{SC}	$V_{IN}=35V$		250		mA
Dropout Voltage	V_D			2.0		V

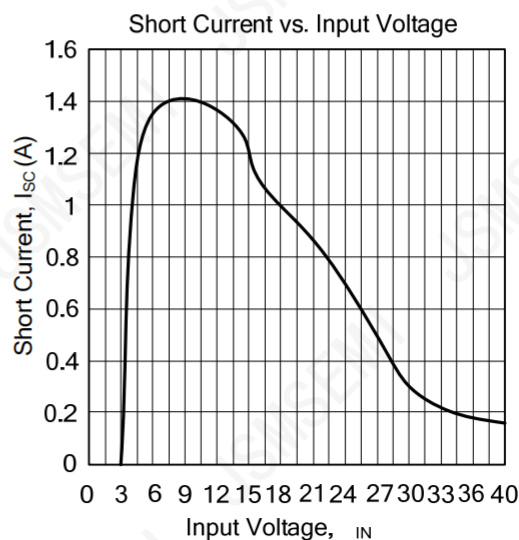
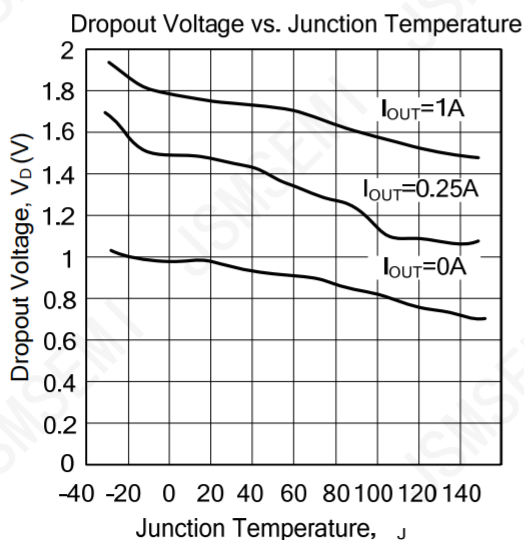
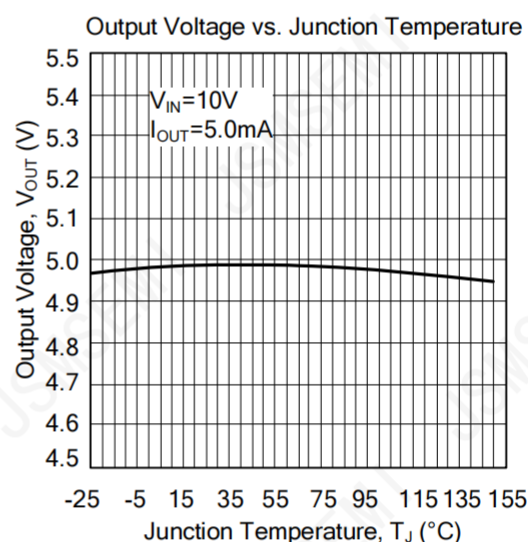
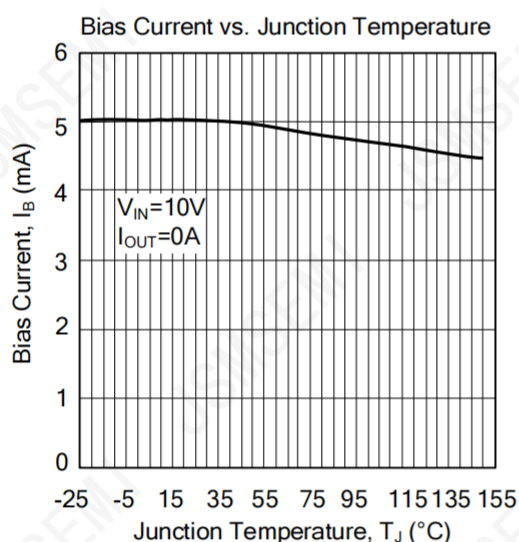
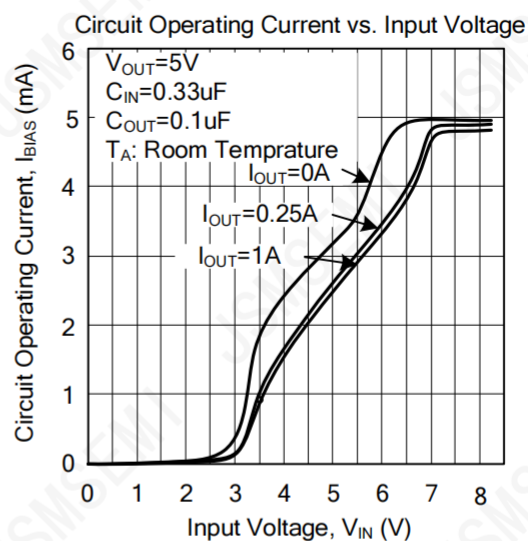
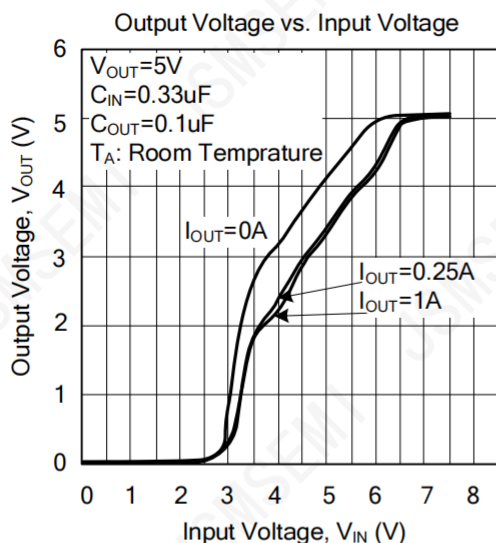
For 78D15AA ($V_{IN}=23V$, $I_{OUT}=0.5A$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$I_{OUT}=5mA\sim1.0A$	14.40	15.0	15.6	V
		$V_{IN}=17.5\sim30V$, $I_{OUT}=5mA\sim1.0A$	14.25		15.75	V
Load Regulation	ΔV_{OUT}	$I_{OUT}=5mA\sim1.5A$			150	mV
		$I_{OUT}=0.25A\sim0.75A$			75	mV
Line Regulation	ΔV_{OUT}	$V_{IN}=18.5\sim30V$			150	mV
		$V_{IN}=17.7\sim30V$, $I_{OUT}=1.0A$			150	mV
Quiescent Current	I_Q	$I_{OUT}\leq1.0A$			8.0	mA
Quiescent Current Change	ΔI_Q	$V_{IN}=17.5\sim30V$			1.0	mA
		$I_{OUT}=5mA\sim1.0A$			0.5	mA
Output Noise Voltage	eN	$10Hz\leq f\leq 100kHz$		90		μV
Temperature coefficient of V_{OUT}	$\Delta V_{OUT}/\Delta T$	$I_{OUT}=5mA$		-1.8		mV/°C
Ripple Rejection	RR	$V_{IN}=18.5\sim28.5V$, $f=120Hz$	54	70		dB
Peak Output Current	I_{PEAK}			0.5		A
Short-Circuit Current	I_{SC}	$V_{IN}=35V$		250		mA
Dropout Voltage	V_D			2.0		V

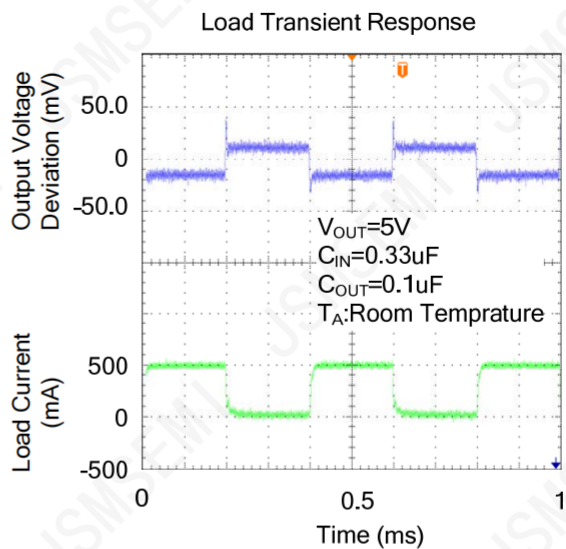
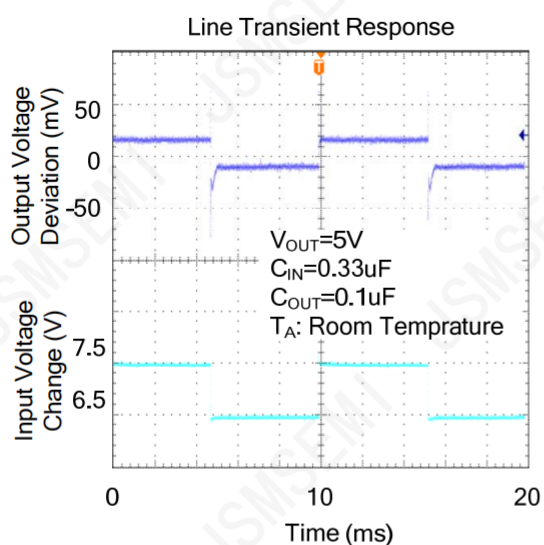
For 78D18AA ($V_{IN}=27V$, $I_{OUT}=0.5A$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$I_{OUT}=5mA\sim1.0A$	17.28	18.0	18.72	V
		$V_{IN}=21\sim33V$, $I_{OUT}=5mA\sim1.0A$	17.1		18.9	V
Load Regulation	ΔV_{OUT}	$I_{OUT}=5mA\sim1.5A$			180	mV
		$I_{OUT}=0.25A\sim0.75A$			90	mV
Line Regulation	ΔV_{OUT}	$V_{IN}=21\sim33V$			180	mV
		$V_{IN}=21\sim33V$, $I_{OUT}=1.0A$			180	mV
Quiescent Current	I_Q	$I_{OUT}\leq1.0A$			8.0	mA
Quiescent Current Change	ΔI_Q	$V_{IN}=21.5\sim33V$			1.0	mA
		$I_{OUT}=5mA\sim1.0A$			0.5	mA
Output Noise Voltage	eN	$10Hz\leq f\leq 100kHz$		110		μV
Temperature coefficient of V_{OUT}	$\Delta V_{OUT}/\Delta T$	$I_{OUT}=5mA$		-2.2		mV/°C
Ripple Rejection	RR	$V_{IN}=22\sim32V$, $f=120Hz$	53	69		dB
Peak Output Current	I_{PEAK}			0.5		A
Short-Circuit Current	I_{SC}	$V_{IN}=35V$		250		mA
Dropout Voltage	V_D			2.0		V

Typical Characteristics

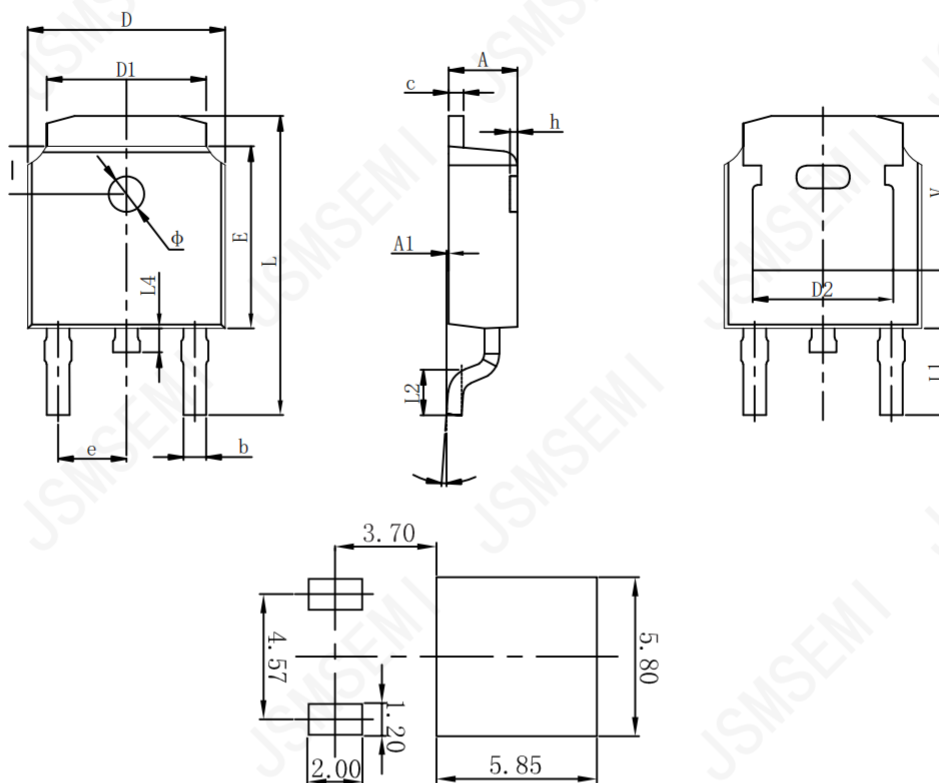


Typical Characteristics(Cont.)



Package Information

TO-252-2



RECOMMENDED LAND PATTERN (Unit: mm)

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.635	0.770	0.025	0.030
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 REF.		0.190 REF.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.712	10.312	0.382	0.406
L1	2.900 REF.		0.114 REF.	
L2	1.400	1.700	0.055	0.067
L3	1.600 REF.		0.063 REF.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.250 REF.		0.207 REF.	