PRELIMINARY | Data Sheet | April 13, 2004 | FN7388.1

300MHz Low Power Current Feedback Amplifiers with Enable

The EL5162, EL5163, EL5262, EL5263, and EL5362 are current feedback amplifiers with a bandwidth of 300MHz. This makes these amplifiers ideal for today's high speed video and monitor applications.

With a supply current of just 1.5mA and the ability to run from a single supply voltage from 5V to 12V, these amplifiers are also ideal for handheld, portable or battery-powered equipment.

The EL5162 also incorporates an enable and disable function to reduce the supply current to 100µA typical per amplifier. Allowing the $\overline{CE}$ pin to float or applying a low logic level will enable the amplifier.

The EL5162 is available in 6-pin SOT-23 and 8-pin SO packages, the EL5163 in 5-pin SOT-23 and SC-70 packages, the EL5262 in the 10-pin MSOP package, the EL5263 in 8-pin MSOP and SO packages, and the EL5362 in 16-pin SO (0.150") and QSOP packages. All operate over the industrial temperature range of -40°C to +85°C.

Features

- 300MHz -3dB bandwidth
- 2500V/µs slew rate
- 1.5mA supply current
- Single and dual supply operation, from 5V to 12V supply span
- Fast enable/disable (EL5162, EL5262 & EL5362 only)
- Available in SOT-23 packages
- High speed, 1.4GHz product available (EL5167 & EL5167)
- High speed, 4mA, 600MHz product available (EL5164 & EL5165)

Applications

- Battery-powered equipment
- Handheld, portable devices
- Video amplifiers
- Cable drivers
- RGB amplifiers
- Test equipment
- Instrumentation
- Current to voltage converters

Ordering Information

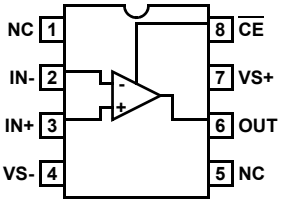
PART NUMBER	PACKAGE	TAPE & REEL	PKG. DWG. #
EL5162IS	8-Pin SO	-	MDP0027
EL5162IS-T7	8-Pin SO	7"	MDP0027
EL5162IS-T13	8-Pin SO	13"	MDP0027
EL5162IW-T7	6-Pin SOT-23	7" (3K pcs)	MDP0038
EL5162IW-T7A	6-Pin SOT-23	7" (250 pcs)	MDP0038
EL5163IW-T7	5-Pin SOT-23	7" (3K pcs)	MDP0038
EL5163IW-T7A	5-Pin SOT-23	7" (250 pcs)	MDP0038
EL5163IC-T7	5-Pin SC-70	7" (3K pcs)	P5.049
EL5163IC-T7A	5-Pin SC-70	7" (250 pcs)	P5.049
EL5262IY	10-Pin MSOP	-	MDP0043
EL5262IY-T7	10-Pin MSOP	7"	MDP0043
EL5262IY-T13	10-Pin MSOP	13"	MDP0043

PART NUMBER	PACKAGE	TAPE & REEL	PKG. DWG. #
EL5263IY	8-Pin MSOP	-	MDP0043
EL5263IY-T7	8-Pin MSOP	7"	MDP0043
EL5263IY-T13	8-Pin MSOP	13"	MDP0043
EL5263IS	8-Pin SO	-	MDP0027
EL5263IS-T7	8-Pin SO	7"	MDP0027
EL5263IS-T13	8-Pin SO	13"	MDP0027
EL5362IS	16-Pin SO (0.150")	-	MDP0027
EL5362IS-T7	16-Pin SO (0.150")	7"	MDP0027
EL5362IS-T13	16-Pin SO (0.150")	13"	MDP0027
EL5362IU	16-Pin QSOP	-	MDP0040
EL5362IU-T7	16-Pin QSOP	7"	MDP0040
EL5362IU-T13	16-Pin QSOP	13"	MDP0040

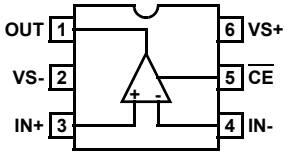
CAUTION: These devices are sensitive to electrostatic discharge; follow proper IC Handling Procedures.
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Pinouts

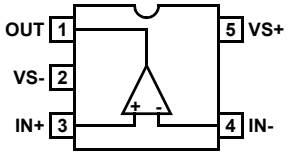
EL5162
(8-PIN SO)
TOP VIEW



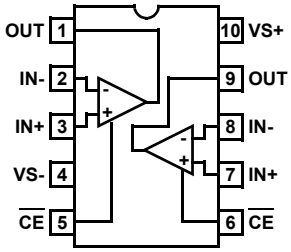
EL5162
(6-PIN SOT-23)
TOP VIEW



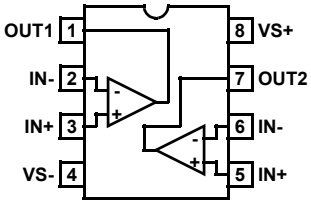
EL5163
(5-PIN SOT-23, SC-70)
TOP VIEW



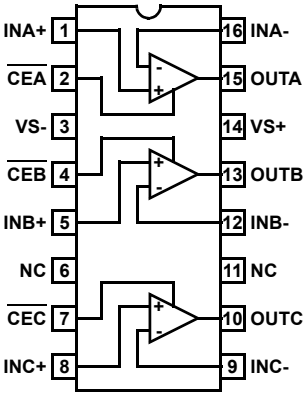
EL5262
(10-PIN MSOP)
TOP VIEW



EL5263
(8-PIN SO, MSOP)
TOP VIEW



EL5362
(16-PIN SO (0.150"), QSOP)
TOP VIEW



Absolute Maximum Ratings (T_A = 25°C)

Supply Voltage between V_S+ and V_S- 13.2V
Maximum Continuous Output Current 50mA
Operating Junction Temperature . . . . . 125°C
Power Dissipation . . . . . See Curves

Maximum Voltage between IN+ and IN-, disabled . . . . . ±1.5V
Current into IN+, IN-, CE . . . . . ±5mA
Pin Voltages . . . . . V_S- - 0.5V to V_S+ +0.5V
Storage Temperature . . . . . -65°C to +150°C
Ambient Operating Temperature . . . . . -40°C to +85°C

CAUTION: Stresses above those listed in "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied.

IMPORTANT NOTE: All parameters having Min/Max specifications are guaranteed. Typical values are for information purposes only. Unless otherwise noted, all tests are at the specified temperature and are pulsed tests, therefore: $T_J = T_C = T_A$

Electrical Specifications

V_S+ = +5V, V_S- = -5V, R_F = 750Ω for A_V = 1, R_F = 400Ω for A_V = 2, R_L = 150Ω, T_A = 25°C unless otherwise specified.

PARAMETER	DESCRIPTION	CONDITIONS	MIN	TYP	MAX	UNIT
AC PERFORMANCE						
BW	-3dB Bandwidth	A_V = +1, R_L = 500Ω, R_F = 598Ω		500		MHz
		A_V = +2, R_L = 150Ω, R_F = 422Ω		233		MHz
BW1	0.1dB Bandwidth			30		MHz
SR	Slew Rate	V_O = -2.5V to +2.5V, A_V = +2, R_L = 100Ω (EL5262, EL5263, EL5362)	2000	2500	4000	V/µs
		V_O = -2.5V to +2.5V, A_V = +2, R_L = 100Ω (EL5162, EL51632)	2800	4000	6000	V/µs
t_S	0.1% Settling Time	V_{OUT} = -2.5V to +2.5V, A_V = +1		25		ns
e_N	Input Voltage Noise			3		nV/√Hz
i_N-	IN- Input Current Noise			10		pA/√Hz
i_N+	IN+ Input Current Noise			6.5		pA/√Hz
dG	Differential Gain Error (Note 1)	A_V = +2		0.05		%
dP	Differential Phase Error (Note 1)	A_V = +2		0.15		°
DC PERFORMANCE						
V_{OS}	Offset Voltage		-5	1.5	+5	mV
T_CV_{OS}	Input Offset Voltage Temperature Coefficient	Measured from T_{MIN} to T_{MAX}		6		µV/°C
R_{OL}	Transimpedance		500	1000		kΩ
INPUT CHARACTERISTICS						
CMIR	Common Mode Input Range	Guaranteed by CMRR test	±3	±3.3		V
CMRR	Common Mode Rejection Ratio	V_{IN} = ±3V	50	62	75	dB
-ICMR	- Input Current Common Mode Rejection		-1	0.22	+1	µA/V
$+I_{IN}$	+ Input Current		-8	0.5	+8	µA
$-I_{IN}$	- Input Current		-10	2	+10	µA
R_{IN}	Input Resistance		0.8	1.6	3	MΩ
C_{IN}	Input Capacitance			1		pF
OUTPUT CHARACTERISTICS						
V_O	Output Voltage Swing	R_L = 150Ω to GND	±3.35	±3.6	±3.75	V
		R_L = 1kΩ to GND	±3.75	±3.9	±4.15	V
I_{OUT}	Output Current	R_L = 10Ω to GND	60	100		mA

Electrical Specifications $V_S+ = +5V$, $V_S- = -5V$, $R_F = 750\Omega$ for $A_V = 1$, $R_F = 400\Omega$ for $A_V = 2$, $R_L = 150\Omega$, $T_A = 25°C$ unless otherwise specified. **(Continued)**

PARAMETER	DESCRIPTION	CONDITIONS	MIN	TYP	MAX	UNIT
SUPPLY						
I_{SON}	Supply Current - Enabled, per Amplifier	No load, $V_{IN} = 0V$	1.3	1.5	1.7	mA
I_{SOFF-}	Supply Current - Disabled, per Amplifier	No load, $V_{IN} = 0V$	-25	-14	-5	µA
I_{SOFF+}			-2	0	-2	µA
PSRR	Power Supply Rejection Ratio	DC, $V_S = ±4.75V$ to $±5.25V$	65	76		dB
-IPSR	- Input Current Power Supply Rejection	DC, $V_S = ±4.75V$ to $±5.25V$	-0.5	0.1	0.5	µA/V
ENABLE (EL5162, EL5262, EL5362 ONLY)						
t_{EN}	Enable Time			380		ns
t_{DIS}	Disable Time			800		ns
I_{IHCE}	$\overline{CE}$ Pin Input High Current	$\overline{CE} = V_S+$	5	15	25	µA
I_{ILCE}	$\overline{CE}$ Pin Input Low Current	$\overline{CE} = (V_S+) -5V$	-1	0	1	µA
V_{IHCE}	$\overline{CE}$ Input High Voltage for Power-down		$V_S+ - 1$			V
V_{ILCE}	$\overline{CE}$ Input Low Voltage for Power-down				$V_S+ - 3$	V

NOTE:

1. Standard NTSC test, AC signal amplitude = $286mV_{P-P}$, f = 3.58MHz

Typical Performance Curves

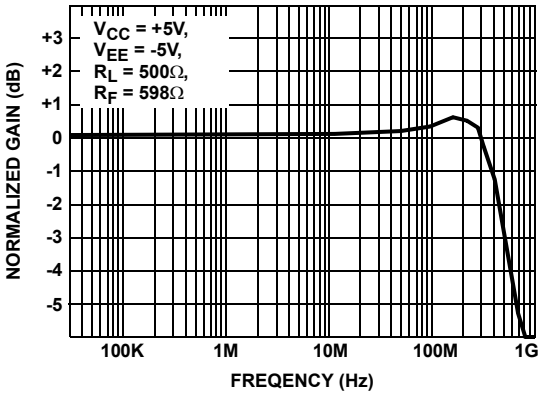


FIGURE 1. FREQUENCY RESPONSE FOR A_V = +1

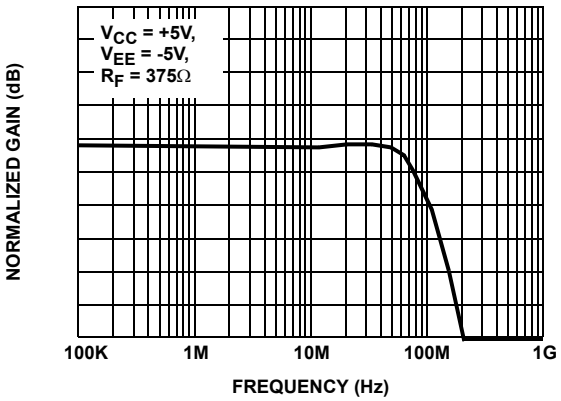


FIGURE 2A. FREQUENCY RESPONSE FOR A_V = +4.6

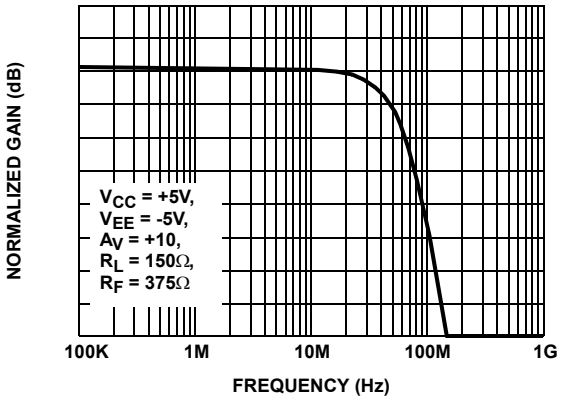


FIGURE 3. FREQUENCY RESPONSE FOR A_V = +10

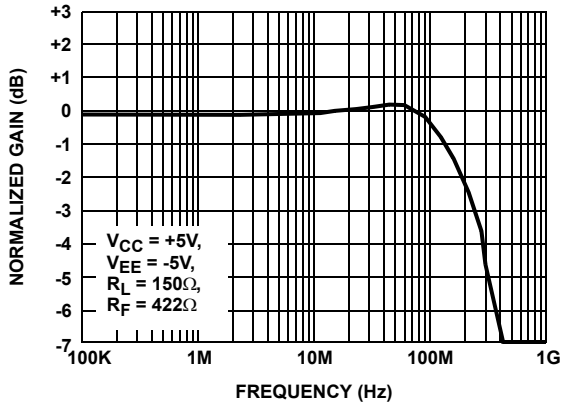


FIGURE 4. FREQUENCY RESPONSE FOR A_V = +2

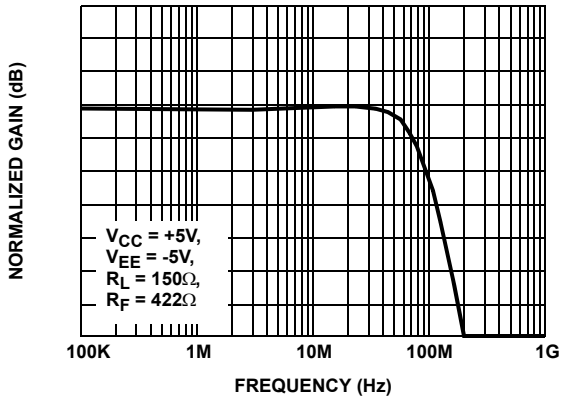


FIGURE 5. FREQUENCY RESPONSE FOR A_V = +4

Typical Performance Curves (Continued)

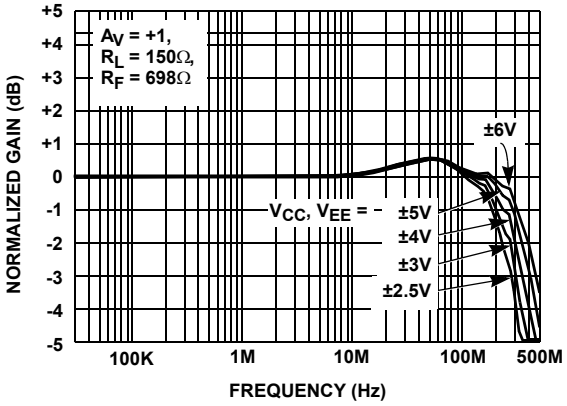


FIGURE 6. FREQUENCY RESPONSE FOR VARIOUS V_{CC}, V_{EE}

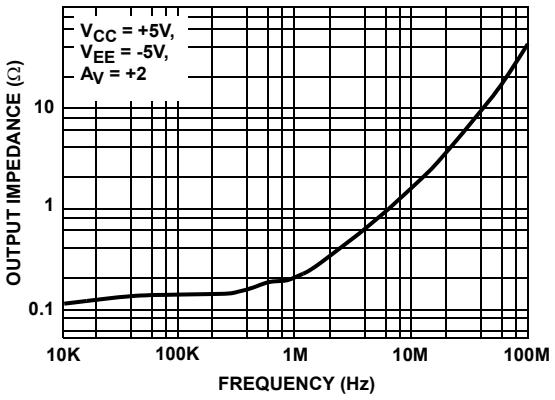


FIGURE 7. CLOSED LOOP OUTPUT IMPEDANCE

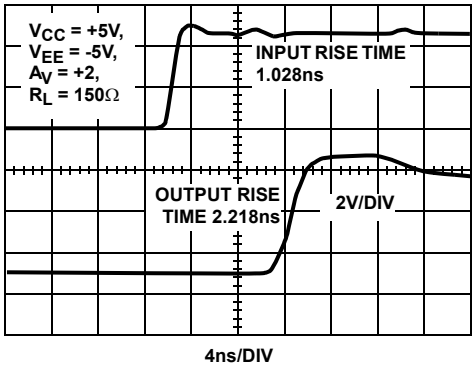


FIGURE 8. EL5262 OUTPUT RISE TIME

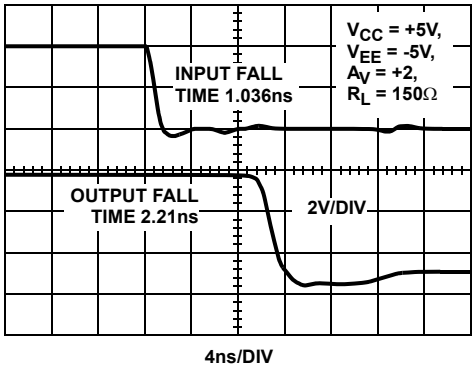


FIGURE 9. EL5262 OUTPUT FALL TIME

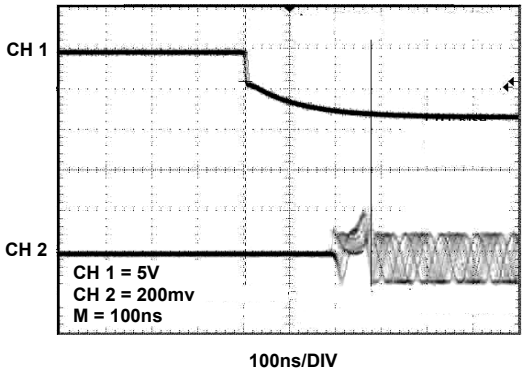


FIGURE 10. TURN ON TIME

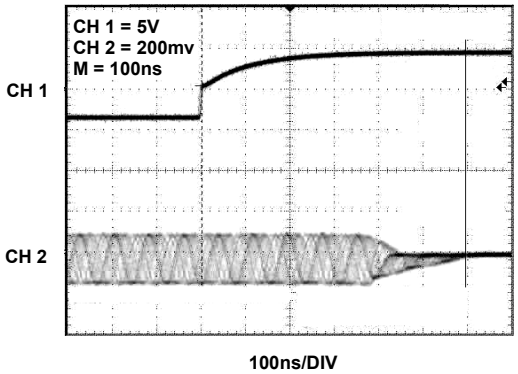


FIGURE 11. TURN OFF TIME

Typical Performance Curves (Continued)

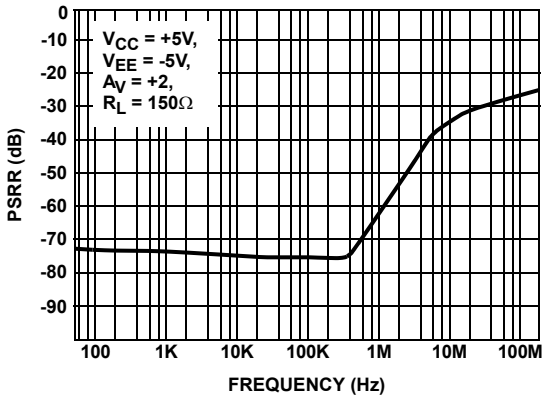


FIGURE 12. PSRR (V_{CC})

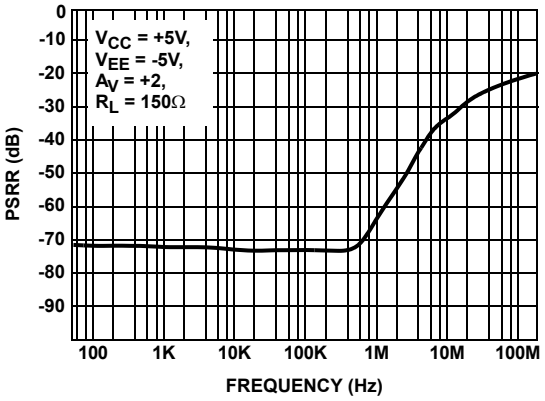


FIGURE 13. PSRR (V_{EE})

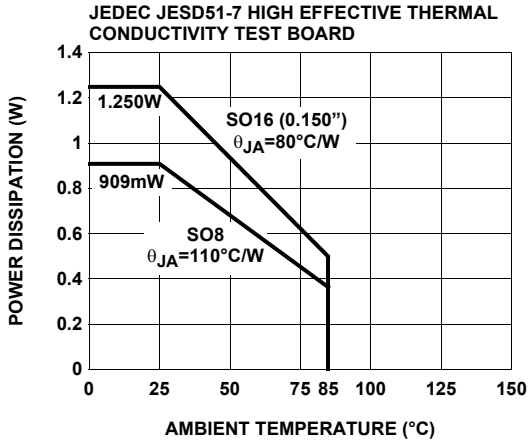


FIGURE 14. PACKAGE POWER DISSIPATION vs AMBIENT TEMPERATURE

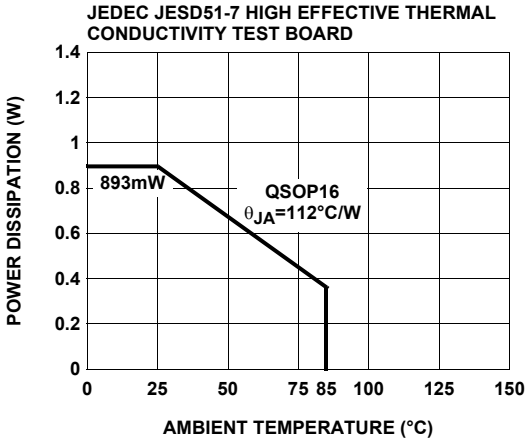


FIGURE 15. PACKAGE POWER DISSIPATION vs AMBIENT TEMPERATURE

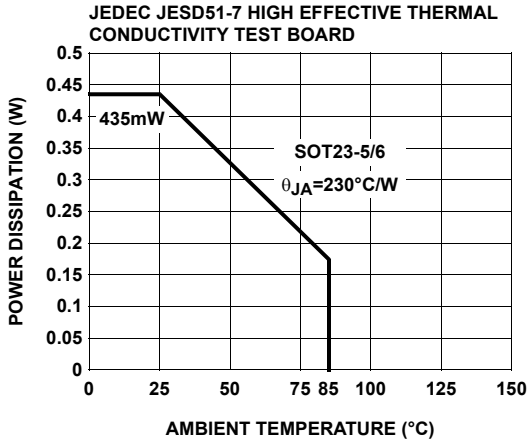


FIGURE 16. PACKAGE POWER DISSIPATION vs AMBIENT TEMPERATURE

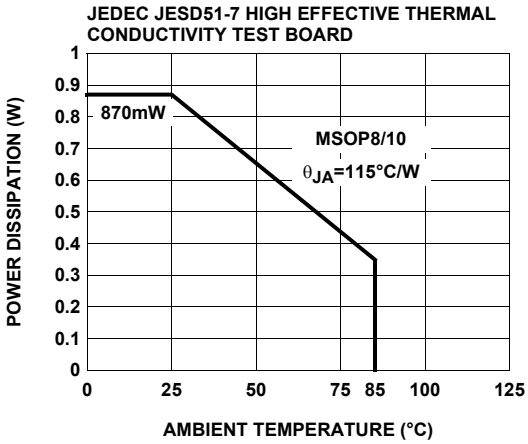


FIGURE 17. PACKAGE POWER DISSIPATION vs AMBIENT TEMPERATURE

Typical Performance Curves (Continued)

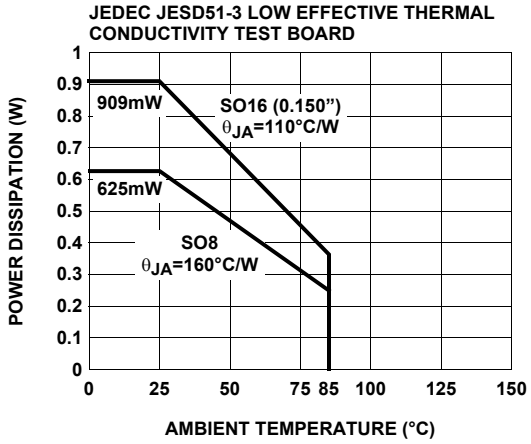


FIGURE 18. PACKAGE POWER DISSIPATION vs AMBIENT TEMPERATURE

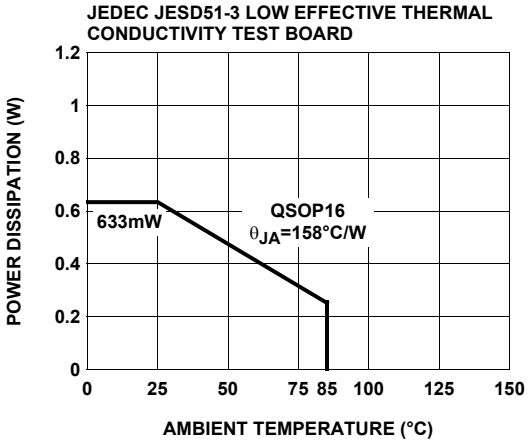


FIGURE 19. PACKAGE POWER DISSIPATION vs AMBIENT TEMPERATURE

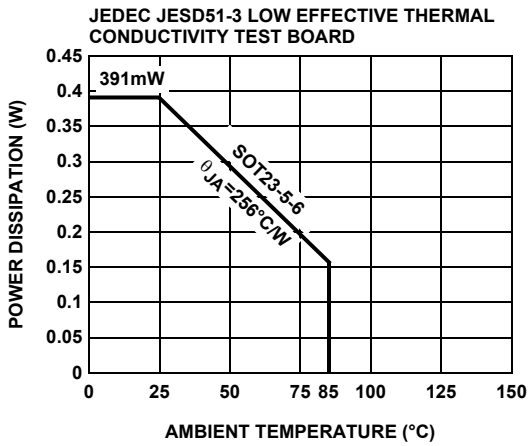


FIGURE 20. PACKAGE POWER DISSIPATION vs AMBIENT TEMPERATURE

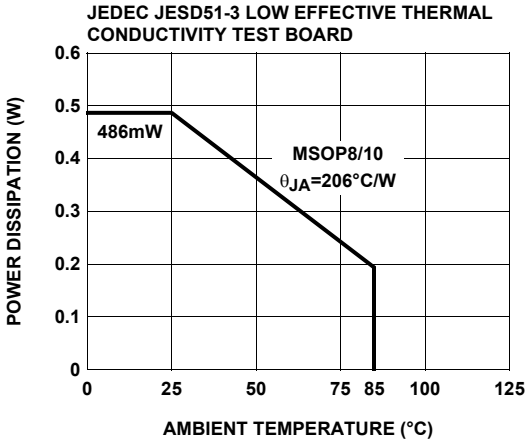


FIGURE 21. PACKAGE POWER DISSIPATION vs AMBIENT TEMPERATURE

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